

OFFICIAL HISTORY OF THE
CANADIAN MEDICAL SERVICES
1939 - 1945

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THE SURGEON GENERAL'S COLLECTION
LA COLLECTION DU CHEF DU SERVICE DE SANTÉ

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NOTE

IN THE writing of this volume the authors have been given full access to relevant official documents in possession of the Department of National Defence; but the inferences drawn and the opinions expressed are those of the authors, and the Department is in no way responsible for their reading or presentation of the facts as stated.

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The National Gallery of Canada

From a painting by Major W. A. Ogilvie, M.B.E.

BRINGING OUT THE WOUNDED

Under enemy fire, casualties from the fighting in the Dittaino Valley, Sicily, are evacuated by jeep ambulance to No. 1 Field Dressing Station at Valguarnera, July 1943.

OFFICIAL HISTORY OF THE
CANADIAN MEDICAL SERVICES

1939 – 1945

Volume One

ORGANIZATION AND CAMPAIGNS

Edited by

W. R. FEASBY, B.A., M.D.

Lieutenant-Colonel, R.C.A.M.C., Supplementary Reserve

Lecturer in Physiology University of Toronto

Illustrated with Paintings and Photographs
by Canadian War Artists and Photographers

Maps drawn by

CAPTAIN C. C. J. BOND

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QUEEN'S PRINTER AND CONTROLLER OF STATIONERY

*A skillful leech is better far
Than half a hundred men of war*

Samuel Butler's translation,
Homer, the *Iliad* Book 11, line 514.

PREFACE

THE MEDICAL SERVICES in the Second World War faced problems which were unique only in size. Perhaps the greatest were those related to authority and autonomy. Because medical problems today are more than ever obscure and difficult of lay understanding, the medical man (in uniform and out) holds a position of semi-seclusion, being regarded generally as an adviser. Authoritarian rule in the army, as it relates to medical matters, is therefore tempered by respect for professional judgement. If the medical officer is certain that an area will kill all the troops placed in it, the commander will not overrule his advice unless wider knowledge and greater necessity force an unnatural decision upon him. Such situations exist throughout the armed forces in democratic states, but perhaps more obviously in the medical services than in other special fields.

We face wars ill-prepared because we believe in the sanctity of human life, and our social structure is designed to prevent the destruction of that life. With the advent of war a new technique must be learned. As long as a man is our enemy, he must be wounded, disabled, killed. But when action ceases, if he be still alive, everyone must do everything to save his life. The conflict of motives ceases at the medical portal. Military medicine has no differences from civil medicine, except those which develop when men are constantly attempting either to fight or to escape fighting and killing.

Many have asked why, in these circumstances, a military medical service is necessary at all. Sir Andrew Macphail remarked in the *History of the Canadian Forces 1914-19*, "The medical service of an army has no existence in itself. It is a vital part of a living fabric . . . Dissevered, it decays and the main body perishes." The medical services are different from any other part of a modern army in that it would be impossible to wage war over the face of the earth without adequate medical knowledge available in the background. Experience has also taught most medical men that without military authority, it would be impossible for them to give their advice adequate force, and to deliver it to the proper place at the right time. Men, when organized into an armed force, behave according to a rigid code which must be established in order to sustain the very abnormal existence they have undertaken. In this existence they forsake normal standards and kill or are killed. There is no room in such a system for anything but order and obedience. The voice of a civilian in a tight spot in the field would be heard as clearly as that of the peasant who screams at the advancing tank, "Do not destroy my house."

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With these singular circumstances in mind, it is interesting to see how these facts have come to the attention of successive generations of medical men, and how armies have fared with their advice.

During the Second World War there were enlisted or appointed in the medical services of the three armed forces, 5219 medical officers, 4172 nursing sisters, and 40,112 other ranks and ratings. Through their hands passed the casualties, which totalled more than two million in medical institutions numbering well over one hundred in Canada and many scores in theatres abroad. Significant advances were made in the treatment of the sick and wounded, and the return of fit personnel to duty made a contribution to solving the problem of manpower for Canada, the significance of which is difficult to estimate. It will be clear from a perusal of the clinical and statistical records contained in Volume II that a remarkable rate of recovery was achieved even for seriously wounded men. Heroic surgery and remarkable feats of therapy became almost commonplace, making these achievements possible. These events are all the more remarkable since they developed in the hands of personnel recruited to what was in 1939 a single Canadian medical corps of only 40 permanent medical officers with other ranks in proportion.

This volume has been designed to describe the activities of the Corps which was responsible for the care of the Army sick and wounded, the development of two sister services for the Navy and Air Force, and the administrative arrangements for other vital medical services in Canada during the Second World War. The accounts are as factual as painstaking research could make them; those who served through the heroic period of history encompassed in these pages will be able to read, between the cold, hard lines, the story of those very personal and colourful events which live in their memories.

* * * * *

Plans were made as early as 1944 for a history of the Army medical services in the Second World War. In 1946 the writer was appointed Medical Historian for the Army, In March of 1947 the Minister of National Defence directed him to prepare a history which would describe the activities of the medical services of all three armed forces, research units, and civil medical organizations during the years 1939-45. An editorial staff was provided to review the large numbers of official files and the Army war diaries from which the principal facts in the present volume were collected. The Royal Canadian Navy's medical branch prepared its chapter of the volume. The section dealing with the R.C.A.F. medical branch was prepared by the medical historian and J. P. McLaughlin, Ph.D. and a small air force committee was formed to review the draft. Reserve officers of the R.C.A.F. medical branch prepared the chapter on B.C.A.T.P. statistics. In Volume II

Preface

(published in 1953) clinical experience is recorded under the authorship of representatives from the three armed forces medical services. To add to the difficulties of a complicated task, a cloudburst in Ottawa in July 1947 destroyed many of the files of the Army Medical Service.

It is impossible to acknowledge in precise detail every contribution which has been made to this volume. Many officers from the three services, both in the medical and administrative branches, have been helpful. The Honourable Brooke Claxton, as Minister of National Defence, gave his support and encouragement. The Directors of the Medical Services for the three armed forces have all given every assistance within their power. The Director of the Army Historical Section, Colonel C. P. Stacey under whose guidance the project was placed at the request of the medical historian, has been of the greatest possible assistance.

A Commonwealth Medical Historians' Liaison Committee was established on the initiative of the British medical historians in 1946. Through the efforts of this group, which brought together representatives from all parts of the Commonwealth, with guests from the United States, it was possible to reduce greatly the efforts of the individual historians. The advice and encouragement thus received, and the exchange of material with other countries' historians, materially assisted the production of this volume.

The excellence of the illustrations is due to the foresight of those who appointed war artists and war photographers as well as to the skill of the men who produced them. To the artists whom it is possible to name, and to the numerous photographers whose names are unknown, appreciation is expressed for the extremely illuminating file of pictures which is available and from which those printed in this volume have been selected. The editor wishes to express special thanks to his staff, without whose assistance this work could not have been completed. In Ottawa Lieutenant-Colonel J. P. McCabe, C.D., M.D., C.M., Major J.C.Morrison, M.A., W.A. McKay, Ph.D., and J. P. McLaughlin, Ph.D. assisted with various sections. Lieutenant-Colonel McCabe prepared the chapters on the Canadian Scene, the Ancillary Services, and Manpower; he also carried the administrative responsibility of the Ottawa office. Major Morrison drafted the chapters dealing with the origin of the medical services, the period spent in the United Kingdom, and the campaigns in the Mediterranean Theatre. Dr. McKay drafted those describing the campaign in North-West Europe. Dr. McLaughlin prepared the chapters dealing with the R.C.A.F. medical branch. Certain other chapters and sections were prepared by the civil and military organizations concerned. In Toronto, Miss D. L. White, Staff-Sergeant W. T. Boyle and Sergeant D. K. Grindlay contributed much to the accuracy and clarity as did also the writer's wife.

W. R. FEASBY

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THE MILITARY MEDICAL SERVICE ON THE EVE OF WAR

THERE are today separate medical services for the Royal Canadian Navy, the Canadian Army, and the Royal Canadian Air Force. The Royal Canadian Dental Corps serves the members of all three services. These are the end products of the expansion that took place during the Second World War in the single military medical service existing in this country in September 1939. Then, the Royal Canadian Army Medical Corps was responsible for all medical and dental services required by the Canadian Armed Forces.

DEVELOPMENT PRIOR TO 1914

The corps may in a sense be said to date from 1885, the year of the Northwest Rebellion. The troops sent to crush Riel and his followers, with the exception of their British commander and a few British staff officers, formed an exclusively Canadian force. Up to this time the medical service of the Canadian Militia had consisted solely of the medical officers appointed to combatant units, purely a regimental medical service. On 1 April 1885, the Minister of Militia selected a prominent surgeon of Cornwall, Ontario, Lieutenant-Colonel Darby Bergin, to organize a medical service more suitable to the requirements of a campaign. Granted the status of Surgeon-General, Bergin discharged his task with notable success. Within a very short time he created a small medical headquarters in Ottawa and dispatched to the field force a number of medical staff officers and two field hospitals complete with equipment and personnel.* Nothing but praise has been recorded for the medical facilities made available to the troops engaged against Riel.

Although Bergin recommended the retention, and even the expansion, of the medical service thus improvised no action was taken in this direction, and the service disappeared with the emergency that called it into being. No steps towards organizing a permanent army medical service as distinct from a purely regimental one appear to have been taken until the late 1890's. Then in February 1898 there was appointed a Director General of Medical Staff. A Canadian Militia Army Medical Department was created in June 1899. Under its control were placed, on the one hand the existing Regimental Medical Service, on the other a new organization designated the Militia

* Reports of the work of Bergin and his colleagues are contained in *The Medical and Surgical History of the Canadian North- West Rebellion of 1885, as told by members of the Hospital Staff Corps*, Montreal, 1886. A copy of this publication is in the Public Archives of Canada.

Army Medical Staff Service. The latter was sub-divided into the Militia Army Medical Staff (officers) and the Militia Army Staff Corps (other ranks). Medical officers posted to the Militia Army Medical Staff were granted combatant rank.

No further basic changes in organization occurred until 1904, but the intervening years saw the formation of numerous bearer companies and several field hospitals, the components of the later field ambulances. Their officers belonged to the Army Medical Staff, their other rank personnel to the Army Medical Staff Corps. The old Regimental Medical Service continued as formerly, although those of its officers who so desired were given the opportunity of joining the new Army Medical Staff.

It was during these years that Canada became involved in the South African War. Approximately 8300 Canadian troops were raised during the course of this campaign, but only about 7400 proceeded overseas. Three regimental medical officers accompanied the first contingent, and four the second. Nursing sisters to a total of 16 were at different times dispatched to the scene of conflict. One field medical unit, No. 10 Canadian Field Hospital, was organized for overseas service during the latter part of 1901, and reached South Africa the following February. At home there were the tasks of examining recruits and providing essential unit medical supplies. In proportion to the number of troops involved, the Army Medical Services of the Canadian Militia, to employ the full title then in use, played a notable part in this, the first overseas war in which Canada officially participated.

Some two years after the South African War, in July 1904, there was a fundamental reorganization of the Militia Medical Services. From this there emerged within the Army Medical Department in place of the Militia Army Medical Staff Service, a Medical Staff and an Army Medical Corps, both under a Director General of Medical Services. The Army Medical Corps was divided into a small Permanent Active Militia Army Medical Corps and a non-permanent Militia Army Medical Corps; each was comprised of both officers and other ranks, and the non-permanent element included dental officers and nursing sisters.* The Regimental Medical Service was entirely separated from the Army Medical Department and made a distinct branch of the Militia Medical Services. Its members were granted combatant rank, and such compound titles as surgeon-major thus finally disappeared.

In 1906 the Medical Staff was abolished as a separate organization, and its members were absorbed into either the Permanent Army Medical Corps or the Army Medical Corps, the simpler designations adopted at the same time for the permanent and non-permanent components respectively. Three years later the final step was taken. In May 1909 it was stipulated that all future appointments to the Medical Service of the Active Militia were to be made to the Canadian Army Medical Corps (C.A.M.C.). Officers of the Regimental

* Nursing sisters were first appointed to the Permanent Army Medical Corps in 1906.

Medical Service were to remain with their units on the same terms as before, but no more were to be appointed. There had finally emerged an army medical service similar in form to the one existing today.

There is little point in considering the details of unit organization prior to 1914, save perhaps to note the development during the years 1905-06 of a new type of unit, the field ambulance. Some 16 field ambulance units were initially authorized, and were formed by combining the existing bearer companies and field hospitals. The chief purpose was to bring Canadian organization into line with that of the British, but it was anticipated that a considerable increase in the efficiency of the medical service would also result. Just prior to the outbreak of the First World War, the C.A.M.C. had on its permanent establishment 20 officers, 5 nursing sisters, and 102 other ranks, and on its non-permanent establishment 6 cavalry field ambulances, 15 field ambulances, and 2 clearing hospitals over and above the medical officers detailed to combatant units of the Militia.

The Canadian Militia had always tended to pattern itself after the British Army. In the years following the South African War, through a series of conferences held in England, Canadian military organization was brought into increasingly close agreement with that of the Mother country. What was true in general was particularly true of the C.A.M.C. throughout all the stages of its development prior to 1914, as the decision to organize field ambulances well illustrates. The first three Directors General were all men with considerable experience of British medical practice, both civil and military. The creation of the Royal Army Medical Corps in 1898 provided a model for the development of an army medical service in Canada, representing as it did the culmination of a long struggle against ingrained prejudice to raise military medicine to a position of equality with the other arms and services of the British Army.

Both in tradition and in organization the C.A.M.C. was well prepared by 1914 to function alongside its British counterpart should the necessity arise. What degree of efficiency it had achieved is more difficult to assess. Its small permanent element was largely occupied with administrative matters and the medical care of the approximately 3000 troops which then constituted Canada's regular army. Non-permanent medical units, the backbone of the Corps, underwent an annual period of camp and field training in addition to whatever training was authorized at local headquarters. But the amount of training depended chiefly on the funds available, and its effectiveness on the number of personnel willing to turn out. Special attention was paid to the training of medical units during the camp season of 1911, and again in the summer of 1914. Although it had been in effective existence for only about 10 years, was comparatively small in numbers, and was perhaps not so highly trained as it might have been, the C.A.M.C. at the outset of the First World War was probably as well prepared for what lay ahead as any other corps.

THE FIRST WORLD WAR, 1914-1919

When war with Germany broke out in August 1914, the Minister of Militia, Colonel (later Lieutenant-General Sir Sam) Hughes, ignored the existing mobilization plans of his military advisers and gave full rein to what might well be described as spontaneous mobilization. For the medical service, this method of raising an expeditionary force created serious and quite unexpected difficulties. The medical examination of recruits, the provision of camp medical facilities, and the organization of the required number of field medical units were but three of the problems demanding immediate and simultaneous solutions. Although inevitably many unfit men were enlisted, a high standard of professional training and a sound spirit were evidenced in this emergency. The 'First Contingent' was spared any epidemic of sickness during the period of its concentration at Valcartier, in the face of conditions that could easily have led to medical disaster. From the permanent and non-permanent elements of the C.A.M.C. some 30 regimental medical officers and 10 medical units were provided within a month for overseas service.

As the war dragged out its weary course, necessitating the dispatch overseas of further contingents and heavy reinforcements, the commitments and responsibilities of the medical service steadily increased, both at home and overseas. To meet these the C.A.M.C. was almost continually in the process of expansion. On 1 June 1915 its overseas strength in personnel was 4533, and there were some 22 medical units serving the Canadian Expeditionary Force in either England or France. By 1 June 1918 the strength overseas had risen to 15,519 (1386 officers, 1829 nursing sisters, and 12,304 other ranks), while the number of medical units had increased to 68, of which 37 were hospitals of various types. In Canada, to provide medical care for returned casualties as well as for garrison troops and those preparing for overseas duty, there were available by 31 October 1918 medical personnel to a total of 5452 and 65 military hospitals with a bed capacity of 12,282. Viewed in perspective against a total enrolment in the Canadian Army during the First World War of 628,462, of whom 424,589 served overseas, the need for a medical service of such proportions can be appreciated.

The C.A.M.C. proved equal to this rapid and enormous expansion. There were no doubt minor failures in its work and individual instances of incompetence among its members. But its general efficiency as an integral part of the military machine and its mastery of military medicine were fully proved. In the words of Sir Andrew Macphail: "The Canadian army held the field for four years without any of those failures in the medical service, by which so many campaigns have been marred."*

* Macphail, Sir Andrew, *Official History of the Canadian Forces in The Great War 1914-19, The Medical Services*, p. 402.

This record of success was achieved despite the very serious controversy that developed during 1916 over the administration of the Corps, particularly that part of it stationed in the United Kingdom. The number of medically unfit personnel arriving overseas, the distribution of Canadian patients in England to hospitals not under Canadian control, the detachment of Canadian medical officers to assist the British in scientific projects, the employment of Canadian medical units in battle areas where no Canadian troops were engaged, all such facts and procedures were open to misinterpretation by those far from the scene or imperfectly instructed in the conduct and problems of war. In July 1916 the Minister of Militia appointed a special Inspector-General to investigate the overseas medical situation.

The sequel was most unfortunate. The special Inspector-General in due course rendered a comprehensive report on his investigations and recommended numerous changes. The Minister of Militia then decreed that he was to supplant the serving Director of Medical Services in the United Kingdom and proceed with the recommended reorganization. But the new Director soon found that the situation which he had criticized, and with which his predecessor appears to have been fully conversant, was not so easily altered as he had anticipated. The question of medically unfit personnel, for example, was capable of solution only in Canada. The segregation of Canadian patients in Canadian hospitals was at that time a matter of military and financial inexpediency. The suggestion that Canadian medical officers should on no occasion be attached to one of the British Medical Services, or that Canadian medical units should not be sent to areas in which there were no Canadian troops, could not withstand serious examination in view of the close association of the Canadian and the British forces. Little in fact was achieved by the new Director during his short term of office. The chief immediate result of the whole controversy was to create a thoroughly unpleasant atmosphere throughout the C.A.M.C., aside entirely from the doubts raised in the public mind as to its efficiency.

The long-term result was more significant. "The principle that animated the conduct of the Inspector-General, and of the Minister too, was civilian administration of a military force",* according to Macphail. This is perhaps open to dispute as an over-simplification. Under the democratic system the armed forces must remain subordinate to the civil authority. In attempting from Ottawa to maintain tight control of the overseas forces, Sir Sam Hughes possibly thought that he was simply putting this principle into practice. His mistake it would seem was in failing to make any distinction between the direct and indirect control that the civil authority must exercise over the armed forces as a whole and the internal administration of those forces that is the proper function of military command. Though it is perhaps difficult to say precisely where the line should be drawn between civil and military

Macphail, *op cit*, p. 184.

control, it is certain that civilian interference with any part, as distinct from the whole, of a military organization can only lead to unsatisfactory results.

In selecting the medical service for special attention the Minister was assured of a prompt reaction, for nothing so rapidly excites public opinion in wartime as any suggestion that the sick and wounded are not receiving the best attention that medical science can provide. The resulting political storm contributed to the Government's repudiation of his policies, and in November 1916 he was forced to resign. The system of controlling the overseas force was then reorganized to ensure as nearly as possible the correct division of responsibility between the civil and the military authorities.

At home, this problem in its medical aspects was not settled until 1918. Early in the war a Military Hospitals Commission was formed to take charge of returned casualties. This civilian organization, completely independent of the military authorities, eventually assumed control of hospitalization arrangements not only for casualties being returned from overseas but also for many of those originating in units mobilizing or permanently stationed in Canada. So unsatisfactory did this arrangement prove, that early in 1918 it had to be drastically altered. A large number of the hospitals operated by the Commission were taken over by the Department of Militia and Defence, and all military patients were brought under the control of the Adjutant General until discharged to civil life as unfit for further military service. To provide for the further hospitalization and subsequent vocational training of patients discharged as unfit, the Department of Soldiers' Civil Re-establishment was created; the Military Hospitals Commission, under a new name, was absorbed into it.

Once the war was over, the Department of Militia and Defence gradually transferred most of its hospitals to the Department of Soldiers' Civil Re-establishment. This avoided the maintenance of a permanently large military medical service, and permitted the demobilization of patients requiring lengthy treatment.

The decisions of 1916 and 1918 were distinctly against direct civil control of a military medical service in whole or in part. Nevertheless, the point was debated at length by the Canadian Medical Association at its annual meetings in 1919, 1920, and 1921, and a scheme for control of the medical service by a semi-civilian body was published in its official journal. On the outbreak of the Second World War, as will appear in a later chapter, civil control in part was again proposed, thinly disguised in new garb.

THE INTER-WAR YEARS, 1919-1939

The reorganization of the Canadian Active Militia that followed the cessation of hostilities in 1918 had as its chief aim, financial economy. There was created what appeared on paper to be a strong force of Non-Permanent Active Militia (N.P.A.M.) consisting of 4 cavalry divisions, 11 infantry

divisions, and certain ancillary units and formations. A Permanent Force, whose strength was not to exceed 10,000, was also authorized. Until 1936, however, the annual defence appropriations were quite insufficient to maintain anything approaching such an imposing military establishment, due to the apathy of the general public and consequently of the Government to the requirements of the Militia. As a result, the strengths both of the Permanent Force and of the N.P.A.M. remained far below their authorized levels. Training on anything but a very small scale was impossible during these years, and morale tended to drop, particularly in the N.P.A.M.

By 1936 the international situation had reached such a point in its course of deterioration since the Japanese invasion of Manchuria in 1931 that its implications in terms of national defence could no longer be ignored. The sum voted for the Militia Services in the fiscal year 1935-36 was \$10,141,230, against \$8,888,030 the year before. In the last complete fiscal year before the outbreak of the Second World War, the total amount expended by the Department of National Defence was \$34,799,192. Of this, \$15,768,166 went to the Militia.

The increased sums made available for defence purposes from 1936 onward were extremely modest by comparison with the efforts of most other countries, and they were perhaps hardly commensurate with the needs of the moment. It is necessary to add that in doing this much the Government of the day achieved a greater degree of defence preparedness than ever before existed in Canada. Also, it would appear to have been several strides ahead of public opinion in realizing the dangers of the international situation and the preparatory measures necessary to Canadian security.

Of much greater significance in the long run than the increased defence appropriations was the thorough reorganization of the N.P.A.M. in 1936. The 4 cavalry and 11 infantry divisions were reduced to 1 cavalry and 6 infantry divisions, with the necessary supporting arms and services. Outwardly a reduction of the Canadian defence forces, this merely brought theory more closely into line with facts. The new organization in one way or another absorbed most of the existing N.P.A.M. personnel; though many units were disbanded, others had to be created in order to provide a balanced force. More to the point, new members were attracted in considerable numbers.

The combined effect of reorganization and larger defence appropriations was to increase markedly the effective strength of the N.P.A.M. The number of officers and other ranks attending summer training camp was 12,720 in 1934, 17,997 in 1937, and 30,648 in 1939. This indicates a much greater improvement than the small increase in actual enrolment from 48,761 in 1935 to 51,418 at the end of March 1939 would perhaps suggest. The Permanent Force, on the other hand, remained virtually unchanged in organization and grew but slightly in size. At 31 March 1939 it could muster but 4169 all ranks.

This is the essential background against which the history of Canada's inter-war military medical service must be considered. The medical component of the Permanent Force was permitted as of 3 November 1919 to adopt the title "Royal", and thus became the R.C.A.M.C. The non-permanent portion of the Corps remained simply the C.A.M.C. until 1 June 1936, when it too was granted the coveted prefix. The abbreviation R.C.A.M.C. (N.P.) thereafter served as its distinctive designation. The Corps as a whole was but one of the important cogs in the military machine. It was not to be expected that it would manage to rise above the general level in strength, efficiency, or morale.

THE R.C.A.M.C.

As formed in 1920 on the reconstitution of the Permanent Force, the R.C.A.M.C. was theoretically larger but actually smaller than its 1914 counterpart, though the proportion of officers was greater. At 31 March 1921, against an authorized establishment of 144 all ranks, its actual strength was 105, comprised of 31 officers and nursing sisters and 74 other ranks. This comparatively small force, organized as a number of detachments because of the nature of its duties, was scattered throughout the country. Broadly speaking there was a detachment in each of the 11 military districts into which Canada was then divided and a twelfth at what shortly became National Defence Headquarters in Ottawa; sub-detachments were provided for such military and station hospitals as the main detachments could not conveniently operate.

In size and organization the R.C.A.M.C. changed remarkably little during the successive years to 1939. The strength to which it was permitted to recruit, governed by the yearly defence appropriations, remained consistently though not far below the authorized establishment until after 1936. Actual strength fluctuated from year to year but tended on the average to be even lower. Over the years, nevertheless, there was a steady if small accumulation of strength. By 31 March 1935 the R.C.A.M.C. was only one man short of its then permitted total of 139 all ranks. The upward trend was more pronounced after 1936. At 31 March 1939 there were 43 officers and nursing sisters and 123 other ranks enrolled. The *Defence Forces List* published in November 1939 shows 42 medical officers and 11 nursing sisters in the R.C.A.M.C., indicating a further and comparatively rapid increase in personnel during the summer immediately preceding the outbreak of war. Also, the number of detachments had recently been raised from 12 to 15, the result chiefly of the work devolving upon the Corps in connection with the Royal Canadian Air Force. These additional detachments were stationed, one at Halifax, one at Vancouver, and one at Toronto.

Control of the widely dispersed R.C.A.M.C. was vested in the Director General of Medical Services (D.G.M.S.), under the direction of the Adjutant

General. Liaison was provided by means of district medical officers, who acted as the local representatives of the D.G.M.S. and were responsible for advising district officers commanding on all medical matters. Control was exercised and co-ordination achieved through the staff of the Directorate of Medical Services in Ottawa, which consisted even in 1939 of only three officers and three other ranks in addition to the D.G.M.S.

The duties and responsibilities of the Directorate and of the R.C.A.M.C. generally remained by no means as limited as their means. During the years 1920 and 1921 the medical requirements of the Permanent and Non-Permanent Active Militia, in relation particularly to the demobilization of the wartime medical service and to post-war reorganization, were the main concern. In 1922, as the result of an Act of Parliament amalgamating the Department of Militia and Defence, the Department of Naval Service, and the Air Board under a new Department of National Defence, the Directorate of Medical Services took over the medical administration of the Navy and the Air Force. This was the beginning of a functional expansion out of all proportion to the modest increases permitted in personnel.

In July 1927, on the creation of a Federal Directorate of Civil Government Air Operations, responsibility for the medical examination of candidates for commercial and private pilots' licences was placed in the hands of the R.C.A.M.C. This, together with instructional courses and lectures in the larger cities on the medical aspects of civil aviation, required a good deal of attention in succeeding years. In the autumn of 1932 the medical supervision of Unemployment Relief Camps, whose organization and administration had been undertaken by the Department of National Defence, devolved upon the R.C.A.M.C. The task was no light one, for altogether some 170,291 men obtained assistance in these camps before the unemployment Relief Scheme was closed down in June 1936. In November 1933 the provision of hospital and specialist services for the Royal Canadian Mounted Police was added to the list of duties. Finally, by 1938 the D.G.M.S. had assumed responsibility for the administration of the Canadian Dental Corps.

In discharging these numerous obligations the constant problem was lack of personnel. The employment of medical officers of the N.P.A.M. was frequently necessary, usually on a part-time but occasionally on a full-time basis. For the military signal detachments on duty at various northern points, and for other such isolated posts, the services of civilian practitioners had on many occasions to be enlisted. Constant use was made of the widespread hospital facilities of the Department of Pensions and National Health,* since the military hospitals maintained by the R.C.A.M.C. were few in number and small in size. Dental services required by members of the armed forces were invariably provided by officers of the non-permanent Canadian Dental Corps or by civilian dentists.

* The Department of Soldiers' Civil Re-establishment and the Department of Health were merged into the Department of Pensions and National Health in 1928.

Special arrangements were a particular necessity in meeting the requirements of the Navy, from which the last permanent medical officer had departed by 1925. Thereafter the R.C.A.M.C. had not only to supervise the medical administration of the Navy but had also to provide the actual services required. To have an army medical officer aboard one of His Majesty's

Canadian Ships during a cruise became routine. In the case of the Air Force, for which full medical services were provided from 1922, outside assistance was less frequently necessary, The R.C.A.M.C. detachments in military districts having air force establishments were gradually increased in size, and under the supervision of the district medical officers managed fairly well in meeting the needs of both services at least until 1938.

In that year, with the volume of Air Force medical work steadily increasing and air commands on the point of being established, steps were taken to create for the Air Force a medical service diverging from that of the Army below the level of the Directorate of Medical Services. R.C.A.M.C. officers experienced in Air Force medical problems were appointed as Principal Medical Officers to Air Commands, with a status equivalent to that of District Medical Officers. They dealt with the Department of National Defence normally through the Air Officers Commanding, Air Commands, but directly with the D.G.M.S. on all technical matters. As the air commands were large, including several military districts, each principal medical officer was given command of an R.C.A.M.C. detachment that was independent of any district medical officer. New ones, as previously mentioned, were formed for this express purpose. Finally, in the spring of 1939, a Staff Officer Medical Services (Air) was appointed to the Directorate of Medical Services to co-ordinate all Air Force medical arrangements under the direction of the D.G.M.S.

From the foregoing it will be clear that the R.C.A.M.C. was subjected to considerable strain by the numerous, responsibilities thrust upon it, despite an appreciable access of strength after 1936. That the outbreak of the Second World War found the Directorate of Medical Services somewhat off balance in its plans and preparations for mobilization is partially attributable to this fact.

THE C.A.M.C. AND THE R.C.A.M.C. (N.P.)

The inter-war history of the C.A.M.C.-from 1 June 1936 the R.C.A.M.C. (N.P.)-falls roughly into two periods, divided by the Militia reorganization of 1936. Throughout, the D.G.M.S. was responsible for control and administration. In military districts liaison with the R.C.A.M.C. was provided by deputy district medical officers. Their duties were more or less nominal, but they accompanied district medical officers on N.P.A.M. inspections. The Defence Medical Association, consisting of branches in each district and a headquarters in Ottawa, provided a valuable medium for

the expression of opinion by non-permanent medical officers. The Association had no official connection with the Directorate of Medical Services, but its elected delegates assembled at annual meetings, discussed policies concerning the welfare of the members at large; when it was thought desirable, resolutions were forwarded to the Department of National Defence. The extent of its influence is difficult to assess, but there is no doubt that its recommendations carried at least some weight in the determination of official policies.

The period of reorganization that followed the First World War produced by 1920 a C.A.M.C. that in addition to regimental medical officers consisted of 77 units of various types, all of them theoretically active. But only a small number of these, 4 cavalry field ambulances, 17 field ambulances, and 2 casualty clearing stations, were in the proper sense of the term active. This restriction was considerably modified in 1921 on the promulgation of temporary peace establishments for medical units of the N.P.A.M. During the succeeding years up to the end of 1929, amidst a welter of changes in organization, the limits on recruiting were still further eased, especially in respect of field ambulances. The C.A.M.C. nevertheless remained far more imposing on paper than it was in actual fact.

On 1 January 1930 there came into effect an N.P.A.M. medical organization that superseded the one of 1920 and the numerous alterations subsequently made to it. This, together with an appropriately revised peace establishment, survived without major amendment until 1936. In addition to regimental medical officers, provision was made for 56 active and 25 reserve medical units. The authorized establishment, over and above 11 deputy district medical officers and 478 regimental medical officers, totalled, for the active units 266 officers and 2739 other ranks, for the reserve units, 435 officers and 11 10 nursing sisters.

The C.A.M.C. nevertheless continued to show signs of internal weakness. That its strength in active officers alone never reached the authorized establishment is by itself of no particular importance, as the same might be said of the whole N.P.A.M. at this period. It is of some significance that although regimental medical officers tended to increase in number, the officer strength of active medical units gradually declined. Moreover, of the officers and other ranks enrolled in these active units, the number participating in any form of annual training was not impressive by comparison even with the modest standards set by the N.P.A.M. generally. Whether through lack of interest or direction, or merely as the cumulative effect of the numerous reorganizations during the preceding decade, the early 1930's found the C.A.M.C. in a very unsatisfactory condition. A General Staff report on all N.P.A.M. units in 1931 listed 61 of the existing 81 medical units as being "moderate to poor" in respect of organization and training for war, a rating well below the average. That 20 of the 56 active units were rated as "efficient to good"

improves the picture only slightly. Not until after the general reorganization of 1936 was there any material change for the better in this state of deterioration.

The first tentative proposals to erect a new frame work for the N.P.A.M. were made in January 1931. But it was considered essential before proceeding with any such reorganization to convince the officers of the militia of the real need for it. There resulted several draft schemes of reorganization and a series of conferences of Canadian Defence Associations to consider them. This procedure, though inevitably a slow one, ensured that within reason the proposed changes met with the approval of the various corps concerned, and that the new organization would thus rest on solid foundations.

The suggestions put forward by the Defence Medical Association and by the D.G.M.S. were for the most part incorporated in the final plan. A parochial expression of concern by the Defence Medical Association as to what was to happen to the officers of surplus medical units was unanswerably countered by pointing out the extent to which the total number of medical officers serving in the N.P.A.M. fell below the authorized establishment. At a later date, nevertheless, specific instructions were issued that officers carried on the strength of medical units about to be disbanded should wherever possible be absorbed in those remaining active. By and large the reorganization developed very little friction in so far as the medical service was concerned.

On 5 June 1936 authority was given to implement the approved scheme of reorganization, and by the end of the year the task had largely been completed. The R.C.A.M.C. (N.P.) emerged with 42 active units (2 cavalry field ambulances, 22 field ambulances, 1 cavalry field hygiene section, 11 field hygiene sections, 6 casualty clearing stations) and 21 reserve units (3 motor ambulance convoys, 11 general hospitals [600-bed], 7 general hospitals [1200-bed]). An additional cavalry field hygiene section was later authorized, bringing the total number of medical units to 64 by 1939. The peace establishment as at the end of 1938 was 11 deputy district medical officers, 384 regimental medical officers, 234 officers, and 2638 other ranks in active medical units, 416 officers and 110 nursing sisters in reserve medical units, and 110 medical officers attached to reserve regimental depots of other arms.

Despite this reduction in its size, the effective strength of the R.C.A.M.C. (N.P.) increased appreciably if not spectacularly between 1936 and 1939. At the end of 1936 there were 642 active officers, 278 reserve officers, and 165 nursing sisters enrolled. In 1939 there were 666 active officers, 316 reserve officers, and 248 nursing sisters. Of the active officers on strength in 1939, 261 belonged to active medical units. Though in 1939 the R.C.A.M.C. (N.P.) was still below establishment in respect to reserve officer personnel, especially nursing sisters, the number of active officers somewhat exceeded the establishment.

More important than this numerical increase was the great improvement in the numbers trained annually after 1936. In active medical units from 1930 to 1936, the total number of officers trained each year averaged 155; the average number attending camp was only 54. During the fiscal year 1938-39, on the other hand, 228 officers trained, 153 of them at a summer camp. There were 189 at camp in the summer of 1939. No figures are available as to the actual enrolment of other ranks, but the number trained during 1938-39 was 1038; the average from 1930 to 1936 was 644. The number of other ranks trained at camp in 1939 was 818, against the 1930-36 average of 243. It can be demonstrated also that in this later period the amount of R.C.A.M.C. (N.P.) training approximated much more closely than in the early 1930's to that being done by the N.P.A.M. as a whole.

There is no documentary evidence as to the official rating of the R.C.A.M.C. (N.P.) on the outbreak of war in 1939. In the light of the facts presented it would nevertheless seem to be a fair conclusion that its general efficiency and standard of training had been raised a good deal above the level of earlier years.

TRAINING

On the whole, however, the increased amount of training carried out by the Militia after 1936, though certainly indicative of improvement in the state of Canadian military affairs, was little more than sufficient to offset the worst effects of previous neglect. The system of training was founded on the premise that the Permanent Force in addition to its other responsibilities would serve as an instructional cadre for the N.P.A.M. If the system were to produce satisfactory results, there were two essential conditions: the Permanent Force had to be sufficiently well trained and sufficiently large to produce the required number of component instructors without impairment of its own efficiency; the N.P.A.M. had to train regularly and in large numbers to derive any substantial advantage from the instruction provided. Neither condition could be met without the annual expenditure of considerable sums of money, which in fact were not available in most years between 1920 and 1939.

In practice, therefore, the system could not function to the best advantage. The Permanent Force not only suffered from a lack of collective training, but was generally short of instructors. As a corollary, N.P.A.M. training frequently had to be conducted by N.P.A.M. officers, whose interest and efficiency were not always of the highest order. In any case the N.P.A.M. trained for too short a period each year and had too few men under training either to receive full benefit from the instruction that was available or to give its officers much experience in handling men. It is only fair to add that many units carried out local training for which no pay was received, and that many of the officers and N.C.Os. expended much of their own time in taking qualification courses.

The situation was further aggravated in the case of the Medical Corps by the fact that the instructional cadre, the R.C.A.M.C., was for the most part scattered throughout the Dominion in small detachments. Professional medical duties engaged almost the full time of each. These of necessity took precedence over instructional duties and the R.C.A.M.C. was able in practice to render to N.P.A.M. medical units only a small measure of training assistance.

The training of R.C.A.M.C. itself was similarly conditioned. The most that it was normally practicable to attempt was individual training within detachments, though undoubtedly the personnel of the sub-detachments normally sent to N.P.A.M. summer camps obtained valuable additional knowledge from the varied duties performed there. Only once was anything in the way of real field training carried out. That was in 1938, when a skeleton field ambulance company was organized to take part in Permanent Force collective training at Camp Borden. Drawn from seven different detachments, 11 officers and 21 other ranks of the R.C.A.M.C. profited greatly from this unique experience, if only through their discovery of the distinction between the theory and the practice of casualty evacuation in the field. A further point is that during the whole of the inter-war period only 10 R.C.A.M.C. officers were privileged to attend courses in the United Kingdom. Desirable as it might be, it was thus very difficult to keep in close touch with technical developments in that much larger organization, the Royal Army Medical Corps.

The training of the non-permanent medical units, aside entirely from the numbers involved, varied widely in quality. This must be borne in mind when considering the training statistics already presented in another connection. Standards tended to differ from one military district to another, even from one unit to another within districts. Local training facilities and the competence of instructors largely governed interest in training, and consequently the benefit derived from whatever training could be done with the funds available. Some units fared better than others by appointing an Honorary Colonel, who contributed financially to the provision of suitable accommodation and the defrayal of unit expenses generally. But in the final analysis the efficiency of a unit depended chiefly on the interest, drive, and personality of the commanding officer. The good one made progress even with limited means. The poor one achieved little at any time.

Lack of uniformity in unit training was countered to some extent by the annual courses of instruction held or supervised by the R.C.A.M.C. for the purpose of qualifying the non-permanent officers, N.C.Os., and specialist personnel of the Corps. Though by absolute standards the number attending these courses was never very large, sufficient officers and other ranks achieved the qualification sought to make this form of training invaluable. Up to 31 March 1938, qualification certificates of one kind or

another were earned by 473 officers and 928 other ranks. It is questionable whether from the long-term standpoint this was not the most valuable type of instruction. It assured at least a nucleus of reasonably competent personnel.

EQUIPMENT

Of greater import than any imperfections in the training either of the R.C.A.M.C. or of the R.C.A.M.C. (N.P.) was the deficiency of military medical equipment evident in 1939.

In line with the general equipment policy in force at the close of the First World War, technical field medical equipment for four divisions, and for the medical units required in support of such a force, was returned to Canada. Some of it was immediately issued for training purposes. The rest was placed in Central Medical Stores or distributed to district medical stores, and was earmarked as mobilization medical equipment.

The Medical Corps like the rest of the Militia had to live mainly on its capital during the greater part of the inter-war period. So far as the records show, 11 ambulance cars for use in military districts and one six-wheeled ambulance for use of the Air Force at Camp Borden constituted the only important equipment purchase on behalf of the Medical Corps between 1919 and the outbreak of the Second World War. In consequence, its mobilization equipment in 1939 consisted largely of what was left from the stocks acquired so many years before. Every effort was made over the years to prevent deterioration in storage and to carry out modifications. What medical equipment there was in 1939 was in good condition, but most of it was obsolescent if not obsolete.

A report prepared in the Directorate of Medical Services during the early part of 1938 stated that with the equipment on hand no more than a dozen regimental medical officers, and no medical unit in excess of one field ambulance, could be placed in the field, and that there was insufficient equipment to provide hospital facilities inside or outside Canada. It was anticipated that a supply of most drugs and dressings could be procured in Canada, but that as far as field medical equipment was concerned there would be no source of supply available after mobilization. The conclusion reached was that it would "not be possible to meet the medical requirements of any force in the field larger than a brigade in Canada or abroad".*

The D.G.M.S. repeatedly endeavoured to have funds diverted to the purchase of medical equipment, particularly those items that could not be secured in Canada. But the increased sums available for equipment purposes after 1936 were largely devoted to the acquisition of modern weapons, ammunition, and vehicles. As late as February 1939 he had to point out that

* H.Q.S. 3498, vol. 12: S.O.M.S. to D.G.M.S., 21 February 1938. Note: All references in this form are to files held by Central Registry, Department of National Defence

although the purchase of mobilization medical stores had been referred to several times, he had "not been given any information" as to what might be expected as a result.

The sum included in the Defence Estimates for 1939-40 in respect of medical stores was \$13,000, only \$2,000 more than in 1938-39. On 25 August 1939 an emergency expenditure of \$8,918,930 for defence purposes was authorized by Governor-General's Warrant. The Militia allotment amounted to \$946,930, of which \$10,000 was earmarked for the provision of medical stores required by the troops scheduled to be called out for duty in connection with coastal defence and the protection of vulnerable points.

MOBILIZATION PLANS

WHATEVER the lack of war material and trained personnel, there did exist in Canada on the outbreak of the Second World War a sound general plan for the mobilization of the Permanent and Non-Permanent Active Militia. It provided not only for coast defence and internal security, but also for the raising of a corps of two divisions with the necessary proportion of ancillary units to serve as a field force either at home or abroad.

Medical mobilization plans, primarily the responsibility of the Directorate of Medical Services under the supervision of the Adjutant General, unfortunately provided an exception to this generally satisfactory state of preparedness. Fragmentary plans there were, but no comprehensive scheme for the provision of medical services adequate to the needs of the forces mobilized for duty at home or abroad.

THE GENERAL PLAN

The First World War had hardly ended when the General Staff, as in duty bound, began to consider the defence of the country and the mobilization of the Militia in the event of another emergency. There were two problems to be faced: first, that of direct defence against violation of Canadian soil; secondly, that of indirect defence by actively participating with other Imperial forces in the protection of common interests abroad. Initially some effort was expended on devising solutions to the first problem, but by 1926 attention was focused mainly on the second.

Several factors, notably the absence of a definite statement of defence policy by the Government and the lack of a sufficient staff to sustain long-range planning projects, led to a considerable delay in working out a detailed scheme for indirect defence. It was the early part of 1932 before one was completed and given the approval of the Minister of National Defence. Designated Defence Scheme No. 3, it was then issued to district officers commanding, who were instructed to prepare their own detailed plans as far as possible.

At this stage Defence Scheme No. 3 dealt with the mobilization and dispatch overseas of a field force comprised of a corps headquarters, one cavalry division, two divisions, and the necessary corps, army, and line of communication troops. Provision was made for concentration camp and base organizations in Canada and overseas. For ease of concentration and movement, the field force was divided into two echelons; each included one complete division, roughly half of the cavalry division, and an equal proportion of ancillary troops. It was intended that the whole force would mobilize simultaneously, but that it would be concentrated one echelon at a time in

a single camp and thence moved overseas. The principles of territorial representation, local and national, and of utilizing so far as possible existing units of the Permanent and Non-Permanent Active Militia were the chief determining factors in its proposed composition.

During the early months of 1937 a thorough revision of Defence Scheme No. 3 was undertaken by reason of a governmental decision that Canada was to be primarily concerned with direct or home defence. A chapter on local defence and internal security was added. This not only laid down the responsibilities of district officers commanding for meeting various forms and scales of attack on ports, inland centres, and other vulnerable points by enemy troops or sympathizers, and for preventing civil unrest, but also prescribed the method of providing forces to meet these risks. The field force, though no change was made either in its composition or in its method of concentration, was designated the Mobile Force, and was allotted as its primary role the defence of Canada in Canada. Arrangements to dispatch the Mobile Force overseas in whole or in part were made the subject of a separate chapter, and it was stated specifically that their implementation would be contingent on government policy in the light of events.

To this latter extent, nevertheless, Defence Scheme No. 3 remained a useful plan whereby an expeditionary force could be dispatched overseas should the government so decide. In the event of such a decision, National Defence Headquarters was to be responsible for the selection of ports of embarkation, for the movement of units to them from whatever concentration camps were established, and for the provision of movement staffs at the ports. Once the area of operations abroad was fixed, an overseas intermediate base would be established to permit, among other things, the maintenance of a supply of reinforcements at a reasonable distance from the theatre of war, and the provision of facilities for the care of casualties. Prior to the departure from Canada of any part of the Mobile Force, it was to be expected that a 'Canadian Overseas Headquarters' would be dispatched to the area selected for the intermediate base. In respect of potential medical requirements, these were the important, though now tentative provisions retained from the original plan.

In its revised form Defence Scheme No. 3 received ministerial approval in March 1937. In addition to the major provisions already outlined, it contained detailed instructions as to the various stages by which it might be put into effect, the exact meaning of the short telegrams proposed to be used for initiating these stages, and the steps to be taken by district officers commanding on receipt of these pre-arranged telegrams. During 1938, to ensure further that in the event of an emergency there would be no delay in mobilization, the executive orders necessary to place the required elements of the Militia on active service were prepared in draft form. These were so arranged as to enumerate in separate lists the units required for the Mobile Force, the coastal garrisons, and the defence of vulnerable points.

In May 1939, the question of a place of concentration for the Mobile Force, thus far left in abeyance, came under active consideration. As there was an increasing probability that if mobilized at all it would be employed as an expeditionary force in Europe, the most useful area for concentration was eastern Canada. But in the absence of any single camp suitable for such a large force, even if concentrated in two echelons, concentration by arms and services in several camps was finally decided upon.

In this same month, a practical test was carried out in the office of the D.G.M.S. as to the length of time required for the medical examination and subsequent attestation of recruits. The conclusion reached, on the basis of what trained personnel proved able to accomplish, was that if medical boards were provided on the scale of two per 1000 men included in war establishments, the minimum time required for mobilization would be 16 days. As this presupposed that medical boards would begin to function at full speed on the first day of mobilization, a condition unlikely to be fulfilled, it was agreed that the time allowed for recruiting units to war strength should be increased from seven to 21 days.

Military districts were notified of these modifications, and of a decision to delete the cavalry division and all cavalry units from the Mobile Force, in an instruction dated 24 June. This expressly stipulated that in the event of war the whole of the Mobile Force would be mobilized simultaneously and subsequently concentrated in several camps across Canada, a list of the camps and the units that were to occupy them being appended. On 21 August, however, district officers commanding were informed that if mobilization occurred late in the year units of the Mobile Force would be accommodated in the areas in which they were mobilized. National Defence Headquarters reached this decision on the basis of the time and expense involved in constructing winter accommodation at the proposed camps.

MEDICAL PLANS

The final order of battle of the Mobile Force, appended to Defence Scheme No. 3, listed the particular units that it was proposed to mobilize in order to provide a medical component of seven field ambulances, four field hygiene sections, two motor ambulance convoys, one advanced depot medical stores, two casualty clearing stations, three general hospitals (600-bed), three general hospitals (1200-bed), one convalescent depot, one mobile bacteriological laboratory, one mobile x-ray laboratory, and one base depot medical stores. In accordance with the requirements of district mobilization schemes, separate provision was made for certain additional medical units or parts of units to be utilized in connection with coastal defence and the protection of vulnerable points.

Such other medical mobilization plans as existed on the outbreak of war were anything but firm. There was on file a plan prepared by the D.G.M.S.

in 1936 against the only contingency then being seriously considered, the dispatch overseas of an expeditionary force. But it had never been revised, and was at best of superficial value as a concomitant to the 1939 version of General Staff plans. *Mobilization Instructions for the Canadian Militia, 1937*, outlined among other things the policy to be followed in the medical examination of recruits, the vaccination and inoculation of recruits, the care of sick personnel during the mobilization period, and the issue of medical equipment on mobilization. This was supplemented by *Physical Standards and Instructions for the Medical Examination of Recruits, 1938*. The difficulty was that hospital arrangements during mobilization, certain aspects of the medical examination of recruits, and even the composition of medical boards, had come into question after the issue of these publications, and generally speaking had not been conclusively settled.

THE COURSE OF MEDICAL PLANNING

The medical mobilization plan prepared in 1936, following the appointment in January of Colonel J. L. Potter as D.G.M.S., was presented to the Adjutant General* for approval in September. In relation to Defence Scheme No. 3 as it then existed, this plan was reasonably complete and detailed except in respect of district medical arrangements. It dealt separately with medical arrangements for the field force, for the intermediate base, and for Canada. A series of appendices contained suggested instructions for various key medical personnel and several organizational proposals.

So far as the field force was concerned, the number of hospitals and other medical units required over and above the normal medical component of divisions was specified in detail. The hospital requirement was based on 10 per cent of the estimated strength of the force, but it was recommended that the actual distribution of hospitals between the theatre of operations and the intermediate base be left to the discretion of the senior medical administrative officer overseas.

The premise adopted in considering the medical requirements of the intermediate base was that the arrangements made for the field force would also suffice the base until such time as the field force proceeded to a war theatre, an estimated period of six months. It was therefore recommended that additional medical units be made available at the intermediate base not later than six months after mobilization. The number and type of units required for this purpose were prescribed.

Medical arrangements for Canada were discussed under three main heads: field force concentration camp; National Defence Headquarters; and district medical arrangements. As to the first, it was pointed out that Defence Scheme No. 3 made provision for the appointment of an Assistant Director

* The Adjutant General at this time was Major-General C. F. Constantine.

of Medical Services (A.D.M.S.) and clerical staff for the field force concentration camp, that medical arrangements for the field force while stationed there should be made at the time of mobilization and be prepared to function when units began to arrive, and that on the basis of experience in the First World War, all personnel should be examined by a standing medical board prior to moving overseas. As it was appreciated that neither the medical units nor the medical personnel of the field force, except for a proportion of the officers of general hospitals, would be available for camp medical duty, it was recommended that medical units additional to those of the field force should be provided for the concentration camp, and that certain officers should be attached permanently to the staff of the A.D.M.S. for duty on the standing medical board. The units considered necessary for this purpose were enumerated, and the suggested composition of the standing medical board was set forth in some detail.

In respect of National Defence Headquarters, a war organization for the Directorate of Medical Services was outlined, together with the duties that would devolve upon the various sub-directorates proposed. What steps would have to be taken to ensure that the field force, the concentration camp, and the troop transports were supplied with essential medical stores and equipment, and the time within which the various items would be required were stipulated.

District medical arrangements were considered only tentatively. But it was intimated that they should include provision for the medical examination of recruits, for the hospitalization of returned casualties, and for the full medical care of all troops permanently or temporarily stationed within their boundaries. As a guide, the D.G.M.S. did state that he proposed to allot to each military district one 200-bed military hospital. This was to furnish the basis for subsequent enlargement or redistribution of hospital facilities.

Of the appendices, perhaps the most important was that presenting a proposed establishment and organization for the office of the "Director General of Medical Services at the Intermediate Base". Generally speaking the overseas Directorate was to be identical with that at Ottawa, and the proposed instructions to its Director reveal that he was intended to be co-ordinate with, rather than subordinate to, the D.G.M.S. in Canada. The remaining appendices, mainly in the form of "Instructions", dealt with such matters as medical responsibilities in relation to embarkation, the disposal of casualties, and the duties incumbent upon district medical officers, the A.D.M.S. contingent concentration camp, embarkation medical officers, and officers in medical charge of troops on board ship. That the plan contained no firm directive as to district medical arrangements has two explanations. First, the D.G.M.S. desired as a preliminary to examine district mobilization schemes, and had requested that he be provided with copies of them. Secondly, there were certain questions of policy which had to be decided before

an effort could be made to co-ordinate district medical arrangements, but on which decisions were still pending at the end of September 1936.

In August 1936 the D.G.M.S. had asked that a policy be laid down with respect to the supply, maintenance, and issue on mobilization of technical medical equipment, and had recommended among other things that information be sought from the United Kingdom as to whether medical equipment that it was not proposed to supply in peacetime could be obtained in sufficient time in the event of war to equip certain medical units at the intermediate base. In that same month the Director of Equipment and Ordnance Services had inquired of the D.G.M.S. what policy it was intended to pursue in the hospitalization of troops in Canada in the event of mobilization, specifically whether hospitals operated by the Department of Pensions and National Health and other civil hospitals were to be utilized. Upon this a prompt ruling had been obtained from the Chief of the General Staff, Major-General E. C. Ashton, a physician as well as a soldier who had had considerable experience' of the Military Hospitals Commission as Adjutant General in 1918 and had been instrumental in its abolition:

We surely learnt our lesson in the Great War. Military Hospitals should be provided from the commencement and expanded as required.*

The D.G.M.S. had then requested a decision on two further matters of policy, the territorial distribution of military hospitals, and the disposal of overseas casualties among them.

This latter request was submitted on 21 September 1936. A month later, as no reply had been received, the D.G.M.S. made a firm recommendation as to the number, size of staff, location, and organization of military hospitals in Canada. Broadly speaking his intention was that they should have a small R.C.A.M.C. establishment supported by a large number of civilian specialists, that each should initially have a 200-bed capacity, and that this should ultimately be so expanded as to include in addition to medical and surgical wings, one for tuberculosis, one for convalescent cases, and, in certain specified centres, one for plastic surgery, mental cases, or neurosurgery.

At this point, consideration of medical mobilization arrangements ceased for the moment, and was not resumed until 1938. Since by then circumstances in the planning field had greatly altered, it would be fruitless to speculate on the probable result had the various matters broached by the D.G.M.S. in 1936 received prompt and adequate attention. In fact, there is no evidence that his mobilization plan was ever approved. Certainly, the policy decisions requested were not taken.

It was in February 1938 that the D.G.M.S. drew to the attention of the Adjutant General the various medical mobilization problems that had been outstanding for over a year. In June a reply was received from the Director of

* HQS 5430 vol 2; D.G.M.S. to D.A.G. 31 August 1936. Minute by C.G.S. 2 September. Major-General Ashton was C.G.S. from 1 June 1935 to 20 November 1938.

Organization and Personal Services, to whom the Adjutant General appears to have referred the matter. This satisfactorily disposed of several minor points that the D.G.M.S. had raised, but on the main issues was rather vague. It stated that medical mobilization stores and equipment should be held for the most part at Central Medical Stores for issue as required, but said nothing about supply of the items that were deficient. As to hospital arrangements in Canada, the D.G.M.S. was invited to submit new proposals based on the various contingencies envisaged in the revised version of Defence Scheme No. 3. As a basis for his new submission, he was promised lists of the units to be mobilized for various types of guard duty in Canada and of the prospective training units and district depots. Against the possibility of the Mobile Force being employed on active service in the field, there was included in the memorandum an estimate of the percentage of monthly wastage by corps. From this, it was suggested, the percentage of casualties likely to require hospital and convalescent accommodation in Canada could be calculated.

It is debatable whether the general outlook regarding mobilization had really changed to such an extent as to warrant new proposals for the provision of hospital accommodation in advance of policy decisions being taken as to the organization, staff, and distribution of military hospitals and the disposal of returned casualties. The D.G.M.S. appears to have thought that it had not. For over two months nothing at all happened. Then, on 12 September 1938, the Director of Organization and Personal Services provided the D.G.M.S. with the lists he had promised in June. On 16 September, though stating that he was working out proposals based on these lists, the D.G.M.S. renewed his efforts to obtain the desired policy decisions, and resubmitted the relevant recommendations of September and October 1936. On this occasion he met with more success than had previously attended his efforts.

The Adjutant General* on 20 September 1938 approved in principle the proposed organization and staff for military hospitals in Canada. Two days later the D.G.M.S. recommended that the partial organization of two such hospitals, tentatively designated base hospitals, should be proceeded with, one in each of the two coastal military districts, Nos. 6 and 11. After outlining the extent to which organization should be completed, he suggested that the necessary accommodation be earmarked for conversion to hospital use, and that the two units be authorized to proceed with the completion of their establishments in personnel and equipment up to a capacity of 200 beds immediately the order to mobilize was given.

Meanwhile, the Adjutant General had taken up with the heads of the other branches of the staff the two remaining policy questions, the distribution of military hospitals and the disposal of returned casualties. In doing so,

* Major-General H. H. Matthews succeeded Major-General C. F. Constantine as A. G. on 15 August 1938.

he recommended approval of the main hospital centres suggested by the D.G.M.S. (Halifax, Montreal, Kingston, Toronto, London, Winnipeg, Regina, Calgary or Edmonton, Vancouver) and of the underlying principle that so far as possible casualties would be returned for hospitalization to the territorial, areas from which they enlisted.

When Major-General Ashton came to consider the two questions thus referred to him, he expressed complete dissatisfaction with the state of medical planning, particularly in respect of hospital arrangements, and directed that a conference be held in his office to discuss the matter. The cause of the existing situation he attributed to lack of co-operation with the D.G.M.S.

I have glanced over the contents of this file and I consider the situation far from satisfactory. Apparently the D.G.M.S. has been earnestly endeavouring to press forward the arrangements in connection with medical services for some years. He does not appear to have been given the necessary information.

The conference was duly held on 30 September 1938. Major-General Ashton outlined the general policy to be followed by the medical service on mobilization and suggested that a general plan be developed for the establishment of sufficient military hospitals to meet the needs that would develop once Defence Scheme No. 3 was put in operation. For the first stage, that of concentrating recruited personnel at their local headquarters throughout Canada, such local medical arrangements as were considered convenient and desirable by district medical officers should be made. The second stage from the medical point of view would be the organization and localization of military hospitals for the care of various types of cases originating from units forming the coastal garrisons, guarding vulnerable points, providing internal security, or composing the Mobile Force. For the operation of these hospitals, it was decided as a matter of policy that it would be desirable to utilize units provided for in the authorized establishments. It was also decided as a matter of policy that discharge to civil life would be carried out in all cases where it appeared that no further military service could be rendered, and it was to be envisaged that patients so discharged would be placed under the care of the Department of Pensions and National Health. It was agreed also, on the basis of a suggestion made by the D.G.M.S., that "the possibilities of utilizing the medical services of the Department of Pensions and National Health to a greater extent during the earlier period of mobilization should be made the subject of further discussion between the officers of the Departments concerned." The provision of suitable medical and ordnance equipment for hospitals, to be held in store, was discussed, but nothing was decided.

A second conference was held on 7 October 1938. The main subjects on the agenda were: co-operation with the Department of Pensions and National Health; special authority for the emergency purchase of medical stores; x-ray of chests as part of the medical examination of recruits; organization

of the Canadian Dental Corps; medical categories; and organization of military hospitals, The first and last of these items arose out of the decisions of the first conference. The rest were new questions only recently raised by the D.G.M.S.

On the subject of co-operation with the Department of Pensions and National Health it was agreed that after a plan had been prepared the matter was to be taken up with the other Department and a definite arrangement concluded.

The medical stores that the D.G.M.S. desired to purchase were such things as surgical dressings, shell dressings, and medical haversacks urgently required to complete technical field mobilization equipment and establish a reserve. It was decided that they should be purchased in the United Kingdom, and that the quantities of some of the items required might be doubled. The cost of purchase, amounting to approximately 10,000, was to be included in the estimates for 1939-40.

The question of a chest x-ray as part of the medical examination of recruits had been made the subject of a special memorandum by the D.G.M.S. in which he expressed the opinion that the advantages to be gained by this procedure were unlikely to balance the accompanying expense and delay in mobilization. The conference concluded that the Department of Pensions and National Health should be invited to meet a committee of the Department of National Defence to discuss the question and make recommendations.

A committee of the Canadian Dental Association, during an interview with the Minister of National Defence on 18 September, had suggested among other things that on mobilization the Canadian Dental Corps ought to be divorced from the medical service and given its own Director General. With this opinion the D.G.M.S. had subsequently recorded his substantial agreement. During the course of the discussion on this subject however, it was brought out that in the military systems of Great Britain and the United States the dental service was under medical administration. To those present it did not appear justifiable, in view of the cost, to establish a separate administrative organization for the Canadian Dental Corps. It was therefore decided that the Canadian Dental Association should be invited to discuss the question again with officials of the Department of National Defence.

In regard to medical categories, the D.G.M.S. had posed three questions; first, whether on mobilization personnel in categories lower than A should be enlisted; secondly, whether the potential value of a candidate temporarily unfit for enlistment would warrant the expenditure necessary for treatment to render him fit and the risk of a possible future expenditure for pension; thirdly, if remedial action were to be taken in certain cases, whether a candidate should be treated while he had civil status, or whether he should first be enlisted and then afforded treatment. It was agreed that the use of lower category men and the treatment of those having remedial defects required consideration, also that the question of enlistment before or after

such treatment needed study from the viewpoint of safeguarding the Government against liability for pension or compensation claims. The D.G.M.S. was instructed to prepare a plan for further discussion and a special document suitable for use in respect of men requiring treatment from which pension claims might result.

Finally, the recommendation of the D.G.M.S. that base hospitals be organized in Military Districts Nos. 6 and 11 came under discussion. It was decided to use hospital units already existing in those districts rather than create new units. The D.G.M.S. nevertheless requested that his proposals concerning 200-bed military hospitals be left on file for emergency use in the event that formed units should not be available. He was then directed to submit a memorandum indicating the availability for duty in Canada of N.P.A.M. hospital units and the extent to which additional hospitals might be required.

Despite these two conferences, the course of medical planning ended eventually in an impasse. In a memorandum of 26 April 1939, the D.G.M.S. reported to the Adjutant General:

Medical Arrangements —

Defence Scheme No. 3

The marginally noted arrangements were completed and forwarded 15.9.36 on the basis available at that date, viz. a field force operating from an intermediate base. Medical arrangements were recommended separately for service in Canada, at an intermediate base, and in a theatre of operations. Various administrative instructions were prepared at that time for the guidance of the D.M.S. Overseas, A.D.M.S. Contingent Concentration Camp, District Medical Officers, Embarkation Medical Officers, etc. . . .

It is appreciated that medical arrangements must be such that they are amenable to amendment as the situation changes. However, much labour has been expended with limited results and before further commitments are made, an appreciation of the existing situation has been made for the favour of your consideration. If in order, details will be worked out and it will be so arranged that amendments may be made from time to time without destroying either sequence or continuity.

The accompanying "appreciation", in the light of the information available in April 1939, was a correct enough assessment of the chief tasks of the medical service on mobilization, and even stated in a general way how it was proposed to carry them out. But no detailed plan ever resulted from it.

Little more ultimately resulted from the specific decisions taken on matters of detail at the two conferences. Hospital arrangements in Canada, and most of the points raised by the D.G.M.S. with respect to the medical examination of recruits, became in the summer of 1939 subjects for discussion by a committee representing the Department of National Defence and the Department of Pensions and National Health. Provision for even the emergency purchase of medical stores, as related in the preceding chapter, was not made until the latter part of August 1939. It was December 1939 before the appointment of a Director General of Dental Services finally settled the question of how the Canadian Dental Corps should be administered.

HOSPITAL ARRANGEMENTS IN CANADA

From the foregoing pages it will be evident that the Department of National Defence had four reasonably firm intentions with respect to the provision of hospital accommodation in Canada in the event of war; first, to maintain whatever number of military hospitals might be required to meet the full needs of the forces mobilized; secondly, to use for this purpose hospital units already on the establishment of the N.P.A.M.; thirdly, to utilize the hospital facilities of the Department of Pensions and National Health during the early stages of mobilization, but only until military hospitals could be made ready; lastly, to discharge to the care of the Department of Pensions and National Health any patients incapable of further military service. Unfortunately, when the necessary discussions were finally opened with the Department of Pensions and National Health, it was found that the views of the two Departments were diametrically opposed.

On 1 May 1939 the Deputy Minister of National Defence forwarded to the Department of Pensions and National Health a letter drafted by the D.G.M.S. in February suggesting the formation of an inter-departmental committee to consider the two questions of apparent joint interest in respect of the proposed hospital arrangements. On that very same date the Deputy Minister of the latter Department, Dr. R. E. Wodehouse, presented to a meeting of the Standing Inter-Departmental Committee on Defence Co-ordination formed by the Government in May 1938 (P.C. 531) a memorandum that read in part:

Shall the peacetime arrangement which exists between the Department of Pensions and National Health and the Department of National Defence for Canada continue in the case of certain eventualities for hospitalization of National Defence Department. personnel by the Treatment Branch of the Department of Pensions and National Health?

It is very important indeed that it be settled that the National Defence need only organize field ambulance for operation in Canada to receive casualties that may occur: give them necessary treatment usually carried out by field ambulance, and arrange for their transfer to hospitals under the administration of the Department of Pensions and National Health...

The Standing Committee decided that this was a subject for direct collaboration between the two Departments concerned. On 6 May Dr. Wodehouse informed the Deputy Minister of National Defence that his Department "would like very much indeed" to establish an inter-departmental committee, "to discuss many phases of the subject matter of your communication."

Meanwhile, the memorandum presented to the Standing Committee on Defence Co-ordination had been communicated to the Department of National Defence. It was interpreted there as a desire to revert to the hospitalization system in effect from 1914 to 1918 and occasioned serious misgivings. For the moment, therefore, while the full implication of this development were investigated, the formation of an inter-departmental

committee remained in abeyance. When finally, on 5 June, the Department of National Defence nominated its representatives to the committee, the Deputy Minister took the occasion to state very firmly the considered hospitalization policy of his Department:

Based on experience gained in the late war, and the principles of military organization and administration, it is considered that the control of military personnel must continue to be the responsibility of the Adjutant General of the Militia Services and the corresponding appointment in the Royal Canadian Navy and the Royal Canadian Air Force.

Consequently it is the policy of this department that the medical service to the Forces should be administered by the Director General of Medical Services under the Adjutant General. . . .

The terms of reference that he proposed for the committee in respect of hospital arrangements were strictly limited: "the extent to which the Department of National Defence may depend upon the Department of Pensions and National Health for—(i) hospital accommodation; (ii) specialists' services".

The reply of the Deputy Minister of Pensions and National Health, setting a tentative date for the first meeting of the committee, was conciliatory, but nevertheless a clear reflection of the opinion that the Department of National Defence should be responsible for casualties only to the extent of clearing them from "fields of conflict".

Of course there is no desire on the part of this Department to presume to suggest that there should be any interference with the control of the Department of National Defence in Canada for casualties and clearing them from actual fields of conflict.

My understanding of my instructions is that the Committee will consider at what point the National Defence Medical Services will choose to turn over casualties to the care of the Treatment Branch of the Department of Pensions after they have been cleared from the field of conflict, and to provide arrangements for repayment for their medical care in hospitals to be arranged for by the Treatment Branch of the Department of Pensions and National Health. . . .

Despite this great disparity in views, the inter-departmental committee eventually met. At a final session on 25 August 1939, attended by both the Deputy Minister of Pensions and National Health and the D.G.M.S., a report was approved. "The members present, following a discussion of several meetings", recommended on the subject of hospital arrangements:

that the Department of Pensions and National Health be authorized to provide treatment and hospitalization for all personnel of the Department of National Defence in Canada in case of mobilization, for a period of six months or until other arrangements are made in so far as Canada is concerned.

In forwarding this report to the Department of National Defence, the chairman, Dr. Wodehouse, conveyed the further information that the Minister of Pensions and National Health had "expressed . . . his readiness

to have this Department carry out the treatment obligations mentioned for the Department of National Defence pending any other arrangements being made or permanently".

At a meeting held in the office of the Adjutant General on 28 August, by which date partial mobilization had begun, it was decided that the offer made by the Department of Pensions and National Health should be accepted as a temporary measure. The formal acceptance, dispatched on the following day, expressly stated: "The offer is accepted until such time as the additional hospital arrangements required by the Medical Services of this Department are completed . . ."

MEDICAL EXAMINATION OF RECRUITS

A thorough medical examination of all recruits and a careful record of the findings produce invaluable results. The services are protected from the disruptive effects and financial burden of enlisting unfit personnel. The recruit receives a double protection: if he is unable to meet the required standards, he is normally rejected and thereby saved endless difficulties; if, on the other hand, he is accepted, his condition on enlistment is recorded, with the result that any pensionable disabilities acquired during services are not open to dispute on discharge. The State is protected against inequitable pension claims. The total recruited manpower is employed economically and usefully through the categorization of each individual as to functional ability. An additional result - an increase in the total manpower available for military duty-can be achieved if the medical service is permitted to provide treatment for recruits with remedial defects.

Mobilization Instructions for the Canadian Militia, 1937, as later amended, laid down that the medical examination of recruits was to be conducted in accordance with existing *Instructions for the Medical Examination of Recruits* and the results recorded on the forms prescribed; great care was to be taken that such entries were full and complete. Officers commanding units were to arrange for the medical examination by a medical board of all serving officers, nursing sisters, and soldiers who volunteered for service in the Canadian field force and of all recruits obtained through general enlistment. When for any reason it was not possible to have personnel examined by a medical board at the place of enlistment, a preliminary examination was to be carried out by the unit medical officer or a R.C.A.M.C. officer especially employed for this purpose; personnel were not to be accepted finally, however, until examined and pronounced fit by a board. The necessary arrangements to ensure that medical examinations were properly carried out were to be included in district and unit mobilization schemes.

Physical Standards and Instructions for the Medical Examination of Recruits, 1938, detailed the examination procedure, and enumerated both

the standards of physical fitness required for acceptance and the principal causes of rejection. Although designed primarily for the peacetime use of the three services, this constituted the *Instructions for the Medical Examination of Recruits* that it was intended should be followed in the event of mobilization. The decision as to physical fitness or otherwise was to rest entirely with the medical officers conducting the examination, but where doubt existed a candidate might be required to produce a certificate from a specialist before a decision was taken as to his category. Standards for the N.P.A.M. were to be the same as for the Permanent Force; except that veterans in, category B might also be accepted. No recruit with a category lower than B was to be accepted even in the N.P.A.M. without authority from National Defence Headquarters. Candidates requiring dental work were to be rejected pending completion of such work at their own expense, Where there remained any element of doubt as to fitness, a recruit was to be rejected.

So far as they went, these manuals were excellent. But for mobilization purposes they made no provision for such commonplace items of the present-day military medical examination as chest x-ray, Wassermann test, and chemical urinalysis, though it is to be noted that chest x-ray had formed part of the medical examination of candidates for entrance to the permanent forces of the Navy, Army, and Air Force since March 1937. Altogether, they appear to have been based more on the experience of the First World War than on later medical practices and conceptions.

In the autumn of 1938, as previously noted, the D.G.M.S. raised the questions of adding chest x-ray to the medical examination procedure on mobilization, of enlisting personnel of categories lower than A, and of providing treatment for recruits with remedial defects. The Department of Pensions and National Health, when approached for an opinion on the subject of chest x-rays as had been directed, proved to be strongly in favour of the procedure and opposed to the expressed view of the D.G.M.S. that the value to be derived from it would not balance the accompanying delay in mobilization. By May 1939 that Department had come to the conclusion that two other matters respecting the medical examination of recruits required urgent consideration: first, the type of medical record to be kept; secondly, the existing physical condition of personnel in the non-permanent elements of the three services.

A special examination of such personnel, though strongly desired by the Department of Pensions and National Health, does not appear to have been accepted as necessary, or even to have been contemplated, by the Department of National Defence. The remaining questions, at least by implication, were submitted along with the problem of hospital arrangements in Canada to the inter-departmental committee formed in June. The committee was expressly directed to consider "the desirability of treatment of applicants for enlistment for defects discovered on medical examination, and, if considered desirable, the procedure to be adopted", also, "the desirability

of routine x-ray examination of chests or other special investigations". It was invited to submit "observations, if any, regarding documents already approved", and to deal with any other relevant matters that might "Come to notice during the proceedings . . . and warrant consideration".

A subcommittee, composed of two medical representatives from the Department of Pensions and National Health and one from the Department of National Defence, considered this agenda and reported to the parent body on 14 July.

The most positive conclusion reached was that an x-ray examination of the chest was "desirable for purposes of record and should be completed within six months of attestation but should not delay mobilization". It was suggested moreover, that the necessary administrative instructions to this effect be prepared.

In respect of remedial treatment, the subcommittee reported that it had reviewed the disabilities most commonly met with, as outlined in *Physical Standards and Instructions for the Medical Examination of Recruits, 1938*. Underweight and underdevelopment, diseased tonsils and minor nasal conditions, defective vision correctable with glasses, dental cavities — any of these it was thought, if the only defect, should be no bar to enlistment provided that the examining officers considered the treatment required would produce the desired results. Serious defects such as hernia, haemorrhoids, and otitis media, "should be considered a cause for rejection in the early days of mobilization or until it could be shown to be in the national interest to accept and treat these conditions". There were cited, also, certain conditions that ought to be a cause of outright rejection as liable to aggravation, or at the very least to be made the subject of special investigation. But no suggestion was made as to what procedure should be followed in the provision of remedial treatment should this be decided upon for certain types of cases.

Apart from recommending the adoption of several specialists' report forms prepared by the Department of Pensions and National Health, the subcommittee had little to say about medical documentation. Nor, despite the wide measure of discretion permitted in the subject matter of its deliberations, does it appear to have considered the enlistment of low category personnel for specific types of duty or any special procedures in the medical examination of recruits other than chest x-ray.

These findings were officially communicated to the Department of National Defence on 25 August as part of the final report of the inter-departmental committee. They did not, of course, constitute a policy decision, and at this late date the Department of National Defence could do little more than set them aside for future consideration. As the Minister of National Defence pointed out, in reply to a letter from the Minister of Pensions and National Health drawing his attention to the subcommittee's report, stressing

the importance of adequate medical documentation, and suggesting that chemical urinalysis be added to the examination procedure:

I am happy to assure you that the extreme importance of medical examination on attestation has long been recognized in my Department, and elaborate provision has been made to ensure that this is properly organized and will function efficiently . . . The report of the Inter-Departmental Committee . . . will be given most careful consideration.

I am advised that it would be difficult to introduce urinalysis as a test during mobilization. The matter will, however, be considered in the period subsequent to mobilization when this, and other investigations not possible in the time available for medical examinations of recruits, will be undertaken. . . .

The Department's position on medical categories at the outbreak of war was as laid down in a recruiting memorandum prepared in May 1939. The Mobile Force was to be composed of category A personnel, subject to the qualification that category B men could be utilized: for units employed on the lines of communication and duties at the base; in all units if employed on sedentary work as clerks, cooks, batmen, orderlies, sanitary duties, and storemen; if skilled tradesmen employed at their trades. Units of coastal garrisons other than infantry could enlist personnel in categories A, B, or C; infantry units were restricted to the first two. Units employed as guards for vulnerable points and prison camps were initially to enlist only category A and B personnel, but ultimately men in category C as well.

DISTRICT MEDICAL MOBILIZATION PLANS

Considering the uncertainties existing at National Defence Headquarters about hospital arrangements and the medical examination of recruits, it was hardly to be expected that district medical officers would succeed in evolving entirely satisfactory administrative plans in respect of these matters, although it was one of their responsibilities to do so. Moreover, the necessary supervision by higher authority to ensure the co-ordination of their plans appears to have been lacking until very late in the day.

As intimated earlier in this chapter, the D.G.M.S. requested in August 1936 that he be provided with a copy of district mobilization schemes. On that same occasion he forwarded to the Adjutant General a memorandum that he intended should serve as a guide to district medical planning. Whether this 'guide' was ever sent out is uncertain. But in September 1938 the D.G.M.S. found it necessary to reiterate his request for information on district mobilization schemes and to state: "there is no knowledge at this office as to what medical plans exist in any district or what arrangements have been made for standing medical boards . . ."

The resulting examination of district mobilization schemes as to their medical content was not encouraging. A wide variation was found in the requirements foreseen, and in certain cases essential arrangements were entirely lacking. There ensued a period in which observations on these

deficiencies were prepared and forwarded to districts. Also, they were directed to report on certain aspects of their proposed medical arrangements, notably those relating to hospitals.

This of course took time, and when the specific reports requested had all been received and examined, much room for improvement was still evident. In submitting on 2 May 1939 another "draft letter for the guidance of military districts", designed to remove these remaining defects, the D.G.M.S. commented: "at present it is thought that a great deal of confusion would be inevitable if mobilization were ordered".

The contents of this 'draft letter' were for the most part incorporated in a sample mobilization scheme sent out to all districts about the middle of June 1939 in conjunction with a general resume of the outstanding faults in their mobilization plans. Under the heading, "District Medical Arrangements and Documentation" precise instructions were given as to most of the points requiring consideration.

Officers in charge of medical boards and district hygiene officers were to be detailed in advance and the necessary instructions for them prepared. Of the three officers composing each medical board, the senior was to be president, and one was to be an eye, ear, nose, and throat specialist. It was pointed out, as a guide, that medical boards would probably not be in a position to function until the second or third day of mobilization, though the time would necessarily vary from one place to another, and that one board could not expect to examine more than 40 applicants per day. Boards were therefore to be provided on the scale of one per 500 men included in the war establishments of the forces being mobilized, and the necessary accommodation for them was to be tentatively allotted. In preparing the lists of medical boards, officers on the strength of medical units were not to be included. Full instructions for the presidents of medical boards were to be drawn up. Attached to this sample scheme was a diagram "showing a suggested typical lay-out for the medical examination and documentation of personnel during mobilization". On the subject of hospitalization, however, nothing was or could be said other than that the policy to be followed was still under discussion.

Between 26 June and 8 August 1939 a representative of the Adjutant General's Branch visited all military districts to assist with the revision of their mobilization schemes. In his subsequent report, submitted on 16 August, he listed among the questions raised during his tour: "the possibility of utilizing the services of civilian medical practitioners and specialists on medical boards during the mobilization period". One of his recommendations was that an exercise should be held in each district covering medical examination, attestation, and documentation. "A practical demonstration . . . would prove of enormous value in clarifying such points as may still be obscure".

On 24 August the Adjutant General informed districts that civilian practitioners could be employed on medical boards during mobilization, but

only when it was impossible to complete them with serving or reserve R.C.A.M.C. officers; the president was in any case to be a medical officer. He stated at the same time that the employment of one eye, ear, nose, and throat specialist on each board was no longer considered necessary. "Obvious visual defects will be apparent to the medical examiners, who will reject officers and other ranks exhibiting these defects . . . In any instance where a specialist's report is considered necessary to establish a candidate's fitness, the individual should be rejected by the board".

To arrange the type of exercise recommended as a means of ensuring complete familiarity with the mechanics of medical examination and related mobilization procedures was of course out of the question by this date.

THE FIRST MONTHS OF WAR

THE increased tempo of defence planning during the spring and summer of 1939 was largely a reflection of the mounting tension in Europe consequent upon the German seizure of Bohemia and Moravia in March and the steadily worsening German-Polish relations in the months that followed. The Canadian Government was kept fully informed of developments, both by the British Government and by its own representatives abroad. Late on 25 August, with war apparently inevitable, orders were dispatched to district officers commanding that the militia units required for coast defence and the protection of vulnerable points were to be called out. The necessary General Order to this effect was promulgated the following day. On 1 September, following the German invasion of Poland, the Government authorized the formation of a Canadian Active Service Force, comprising basically the Mobile Force but also the whole of the Permanent Force,* the various headquarters staffs, and the units forming the coastal garrisons or acting as guards at vulnerable points. On that same date, to the extent that this had not already been done, the Navy and the Air Force were also placed on active service. On 3 September Great Britain and France declared war on Germany. On 7 September the Canadian Parliament met to debate the issue of peace or war for Canada, though the outcome was hardly in doubt. A special edition of the *Canada Gazette* on 10 September proclaimed that this country too was at war.

Meanwhile the Prime Minister, Mr. Mackenzie King, had addressed to the British Prime Minister a telegram that was in effect an inquiry as to what Canadian economic and military assistance was most desired. He stressed that the primary military task would be the defence of Canada, but intimated that consideration was also being given to the possibility of participating in the defence of the Western Atlantic region generally. In order that Canadian policy of further military co-operation might be determined, he requested an appreciation of the probable theatre and character of the main British and allied operations.

The British reply to the purely military aspects of this question, received on 6 September, expressed the hope that Canada would exert her full national effort as in the First World War, even to the extent eventually of providing an expeditionary force, but stated that the difficulty of at once undertaking such a long-term commitment was fully appreciated. It was asked, however, whether as an immediate programme consideration could be given to the dispatch of a small Canadian unit to take its place beside British troops, the provision of technical units for attachment to British formations, and the release of technical personnel for enlistment in British units.

*The Mobile Force included certain Permanent Force units.

The active defence of Canadian shores and territorial waters, and of adjacent British possessions, combined with extensive economic assistance to Great Britain and France, was the war policy contemplated by the Government as best calculated to assist the allied cause. It was the considered opinion of the Canadian General Staff that the corps of two divisions and ancillary troops mobilizing as part of the Canadian Active Service Force could be sent overseas in response to the British call for military aid without imperilling Canadian security under the existing strategical conditions. This force would include among its ancillary troops technical units of all the types requested. The Government decided formally on 16 September that for the time being a large expeditionary force would not be considered, and that the Canadian 'unit' to take its place beside British troops would be a division. Somewhat later in the month it also approved the provision of technical units for attachment to British formations to a total of from 5000 to 6000 all ranks, subject to certain financial and other conditions.

Mobilization of the Militia proceeded largely according to the plans incorporated in Defence Scheme No. 3. Coastal defences were manned, vulnerable points were placed under guard, the Mobile Force was embodied and part of it dispatched overseas, all with a minimum of the confusion that inevitably attends the raising of a citizen army however well planned. The considerable lack of personal equipment, clothing, blankets, and footwear during these early months of the war, combined with the inadequate accommodation in many areas, caused hardship to individuals, probably hampered recruiting, and certainly contributed to the incidence of sickness. Moreover, the Government's decision to send only part of the available field force overseas, the impracticability of establishing concentration camps in the season at which mobilization occurred, and the vesting of responsibility for the hospitalization of troops temporarily in the hands of the Department of Pensions and National Health, resulted first in deferment and then in suspension of the mobilization of many units.

The R.C.A.M.C., in which so far as the Canadian Active Service Force was concerned all distinction between permanent and non-permanent elements disappeared on the outbreak of war, was especially affected by the successive restrictions placed on mobilization. This was the more serious in that the Department of Pensions and National Health made a determined effort to secure permanent control of the treatment and hospitalization of all military patients in Canada. Adding to the uncertainty about the future of the Corps, there was an unfortunate delay in making provision for an overseas medical service commensurate with Canadian requirements. Concurrently a number of professional problems relating to the medical examination of recruits developed.

MOBILIZATION

The partial mobilization ordered during the waning hours of 25 August as a precautionary measure to ensure the safety of the coastal areas and certain vulnerable points inland affected artillery and infantry units mainly. To the troops thus called out "on service", the R.C.A.M.C. contributed details from seven field ambulances. These details together with the 26 medical units of the Mobile Force (Appendix A) were placed on "Active Service" by General Order 135 of 1 September, the military authorization for the Canadian Active Service Force. Initiation of full mobilization was not delayed until the promulgation of this order. The Adjutant General sent out the necessary instructions to district officers commanding shortly after 12.30 p.m. on 1 September. The latter in turn notified the units concerned and put their own mobilization plans into effect.

General Order 139 of 3 September authorized the calling out "for purposes pertaining to the organization of the Canadian Active Service Force" such officers and other ranks as might be selected or detailed by the Adjutant General. This permitted, among other things, the part-time employment of non-mobilized R.C.A.M.C. officers on medical boards.

The first significant change of plan was a decision to retard the mobilization of certain units in order to facilitate the recruiting of those more urgently required. A telegram was sent to all districts on 2 September listing 31 units whose mobilization might be deferred at the discretion of the district officer commanding, 21 of them for 12, the remainder for 21 days. Among those in the first category were No. 1 Mobile Bacteriological Laboratory and No. 1 Mobile X-ray Laboratory, and in the second No. 1 Base Depot Medical Stores. None of the three existed as a peacetime unit after 1936. On 6 September the mobilization of all 31 units was postponed until further notice.

On that same date, in accordance with the conclusions reached during the latter part of August, it was decided that because of the lateness of the season the Mobile Force would not move to concentration camps as planned but would be accommodated locally by districts. The Quartermaster General had already suggested to district officers commanding that the best type of accommodation to take over for this purpose would be government buildings, exhibition buildings, grandstands, unoccupied factories, and warehouses. This decision, in turn, promptly gave rise to a proposal to postpone the mobilization of an additional 45 units. But in accordance with the Minister's direction that this step should be taken in respect only of units not already in the process of recruiting, deferment was effected at this stage in just 11 of the 45. Of these, six were medical units: Nos. 1 and 2 Motor Ambulance Convoys, No. 1 General Hospital (600 beds), No. 8 General Hospital (600 beds), No. 14 General Hospital (1200 beds), and No. 1 Convalescent Depot.

The continuance of recruiting in the remaining 34 units caused considerable concern to the military authorities at National Defence Headquarters. The Adjutant General, for example, expressed the opinion that if the

mobilization of many of them were "permitted to continue", they would become "a fifth wheel to the coach throughout the winter months", unless the Mobile Force were to be used "as such" sooner than appeared likely. At a meeting of the Military Members of the Defence Council on 9 September, it was agreed that "the recruitment of a number of medical units and certain other selected units" ought to be postponed, and that action should be taken to secure the necessary authority.

On the following day, accordingly, the Chief of the General Staff again submitted the question to the Minister.

Arrangements have now been made with the Department of Pensions and National Health for the hospitalization for the time being of personnel of the C.A.S.F. on service in Canada. In consequence of this, and of the abandonment of concentration camps this autumn, a number of medical units now recruiting will not be immediately required. . . .

It is, therefore, recommended that recruiting be suspended . . . until they are more urgently required.

There are also a number of other units now recruiting which it is recommended should be treated in the same way, in view of the fact that they are not immediately required due to the abandonment of the scheme for concentration camps or for other reasons. . . .

The Minister on this occasion approved all the postponements recommended, and the necessary orders to effect them were issued on 11 September. District officers commanding were instructed that the units concerned were to be maintained at their existing strengths, or alternatively, that the personnel were to be attached for administration to some other mobilized unit, whichever might be found more convenient.

Among the units affected by this latest deferment order were No. 8 Field Ambulance, Nos. 5 and 13 Field Hygiene Sections, Nos. 4 and 5 Casualty Clearing Stations, No. 1 Advanced Depot Medical Stores, No. 5 General Hospital (600 beds), No. 13 General Hospital (1200 beds), and No. 15 General Hospital (1200 beds). The number of R.C.A.M.C. units ordered to suspend mobilization was thus brought to a total of 18 out of the 26 forming the medical component of the Mobile Force. No. 13 Field Hygiene Section, a corps troops unit, was subsequently found to have completed its strength in personnel before the deferment order was received. With this exception, as a study of Appendix "A" will reveal, the net result was to leave the Mobile Force with no fully-formed medical units other than divisional ones.

The divisional medical units continued to recruit up until 23 September, when all recruiting was suspended except for the infantry. By that date they were almost but not quite up to war establishment in personnel. According to unit war diaries, the three field ambulances of the 1st Division together lacked only about half a dozen men, while those of the 2nd Division were approximately 50 short of their combined requirements, Against this, No. 3

Field Hygiene Section had failed to enlist any personnel, due to the fact that the commanding officer was unable to obtain his release from civil employment until after the recruiting period was over. As a result, it was eventually replaced in the 1st Division by No. 2 Field Hygiene Section, which was virtually at full strength by the end of the mobilization period.

Recruiting initially presented no great problem to the R.C.A.M.C., No. 9 Field Ambulance, for example, enlisting 89% of its N.P.A.M. personnel. Even those medical units whose mobilization was suspended on 11 September had by that date enlisted on the average roughly half the number of personnel required. Of the eight, two were at better than three-quarter strength, and only one had not begun to recruit.

The real problem facing the R.C.A.M.C. at the end of the mobilization period was of an entirely different character. The desire of the Department of Pensions and National Health to control the treatment and hospitalization of all military patients in Canada had by this time become fully apparent. With the whole of the R.C.A.M.C. organization, normally required in rear of one or more divisions in the field already suspended, the future of the Corps seemed to hang upon the outcome of this developing controversy.

CONTROVERSY OVER HOSPITALIZATION

At 31 March 1938 the R.C.A.M.C. had in operation a total of nine hospitals of various types, with a combined bed capacity of 352. During the remaining months of peace neither the number nor the capacity of these hospitals was substantially increased. When mobilization began, in the absence of any agreed plan for the immediate opening of additional military hospitals, the Department of National Defence had no alternative but to accept as a temporary arrangement the offer of the Department of Pensions and National Health to provide treatment and hospital facilities for military patients in Canada.

Much emphasis was placed on the temporary nature of this agreement. But apart from a limited expansion of existing facilities, the Department did not immediately embark upon a military-hospital programme, preferring for the time being to rely on the resources of the Department of Pensions and National Health. This is clearly reflected in the decision to suspend the mobilization of the six general hospitals of the Canadian Active Service Force. There is other evidence to the same effect. When early in September the D.G.M.S. revived his proposal to organize 200-bed hospitals for service in military districts, which had been rejected in the autumn of 1938, the Adjutant General replied :

I think these District Hospitals should not be set up until the resources of the Department of Pensions and National Health have been fully explored and used while troops are dispersed for winter quarters in so many different towns during the winter, as appears to be the present plan. . .

Further, I think it may be anticipated that the concentration camps will be started early next Spring, when possibly the need for District Hospitals, with the Department of Pensions and National Health facilities already in use and still available, might not be needed.

A few days later one of the district officers commanding was specifically informed that it would be unnecessary to organize military hospitals, "as the Department of Pensions and National Health" would "make all necessary arrangements".

It would appear that uncertainty as to the scale of Canada's military effort and the necessity for financial economy were the chief factors. Admittedly, the cost would have been heavy. In September 1939, a large expenditure on military hospitals appeared unwarranted.

The immediate course adopted certainly did not represent a permanent change in attitude. In response to a plea from the D.C.M.S. that sight should not be lost of "the policy . . . decided upon", namely, "that the R.C.A.M.C. should afford medical care of casualties from mobilizing forces or those called up for duty", the Adjutant General remarked: "this is quite possible as the eventual policy". The Deputy Minister of Pensions and National Health suggested to the Adjutant General on 11 September:

Possibly now that war has been declared by Canada, and the policy announced by the Government that for the present there will be no expeditionary force as such, you would be in the position to let me have a written communication confirming our conversation of recent date . . . that your Department will utilize the services of this Department for the hospitalization of its troops in Canada. . . .

The reply forwarded on 17 September was in no sense ambiguous.

As already stated . . . the Department wishes to avail itself of the hospital facilities of your Department for the accommodation of military patients or troops called up on duty until such time as definite arrangements have been completed for the carrying out of this service by the Medical Services of the Department of National Defence. . . .

On the very next day, nevertheless, the Adjutant General found himself in possession of a formal proposal to relieve the R.C.A.M.C. permanently of almost all responsibility for the treatment of military patients in Canada. It was in the form of a draft Order in Council, which the Minister of National Defence had been asked to submit jointly with the Minister of Pensions and National Health :

The undersigned have the honour, jointly, to recommend that the treatment of members of the naval, military or air forces of Canada while on active service in Canada be placed under the control and management of the Minister of the Department of Pensions and National Health; provided that such emergency and temporary treatment as may be necessary and available shall be supplied by the Medical and Dental Officers of the Department of National Defence who are attached to or on the establishment of units in camps, barracks and stations occupied by members of the naval, military or air forces of Canada on active service; and further provided that such emergency and temporary treatment shall be under the control and direction of the Department of National Defence.

In passing this to the Chief of the General Staff for consideration, the Adjutant General pointed out that the Minister "thought it might be much too far

reaching in effect". His own opinion was that "under its terms the R.C.A.M.C. would simply become an adjunct of the Department of Pensions and National Health, something which in principle as in practice would be detrimental to the fighting forces, and should not under any circumstances be permitted".

At the instance of the Adjutant General, a comprehensive report on the whole problem was now prepared. It outlined the hospital situation from 1914 to 1918, stated that "the policy generally agreed to was that the Department of National Defence would assume responsibility for the care of all casualties until they were actually discharged as unfit for further service, when they would become the responsibility of the Department of Pensions and National Health", and reviewed in detail the negotiations and the arrangements made between the two Departments up to 17 September. The D.G.M.S., for his part, strongly recommended that the Department's "original approved policy" be confirmed and quickly implemented, though suggesting that it would be advantageous to continue the "helpful arrangements" in effect with the Department of Pensions and National Health over the past years.

What discussions, if any, ensued between the two Departments are a matter of conjecture. The available records bear no trace of any communication whatever, but on 25 September the Department of Pensions and National Health produced a new draft of its proposed Order in Council, also intended to be submitted jointly by the Ministers.* The words were not well chosen if the aim was to allay the misgivings of the Department of National Defence or to meet its objections to the original draft. The preamble, after affirming the necessity of providing hospital treatment and institutional care for members of the armed forces, stated that the matter had been thoroughly explored by officers of the two Departments and that "it would be in the public interest, as well as for reasons of economy and efficiency, if such treatment and care were carried out in hospitals and institutions under the control and management of the Department of Pensions and National Health". The first of the proposed "regulations" read:

Should, in the opinion of the Medical Officers of the Department of National Defence, a member of the Forces on active service require hospital treatment or institutional care, such treatment and care will be carried out under the control and management of the Department of Pensions and National Health.

The second stated in effect that personnel undergoing such treatment would remain subject to the laws pertaining to their own service, but that the awarding of punishment for offences would be the responsibility of officers of the Department of Pensions and National Health. The remainder dealt with minor aspects of the problem.

* Mr. Norman McLeod Rogers succeeded Mr. Ian Mackenzie as Minister of National Defence on 19 September 1939; the latter then became Minister of Pensions and National Health vice Mr. C. G. Power, who assumed the portfolio of Post-master General. For several weeks Mr. Power continued to act as Minister of Pensions and National Health.

At this juncture, upon the request of the Minister of National Defence, Major-General E. C. Ashton was recalled from retirement to undertake temporarily the supervision of R.C.A.M.C. hospitalization plans in Canada.* At his first recorded meeting with the Minister, on 29 September, he took the stand that it was essential to give mobilized R.C.A.M.C. units an opportunity of securing practical experience in organization, administration, and treatment, and therefore suggested that where field ambulances, casualty clearing stations, and general hospitals were embodied, they should look after all military patients in their vicinity; except that when all necessary facilities were not available in such units, the more serious cases should be handed over to the Department of Pensions and National Health. That Department, he thought, might also be asked to carry out temporarily the radiological and pathological examinations, blood tests, and other such technical work required by the Department of National Defence, and to undertake the care of military patients in localities where facilities could not be provided by the R.C.A.M.C. But to vest the power of imposing military punishments in the hands of civilians was wrong, he argued. To maintain discipline among patients, serving military officers should be posted to Department of Pensions and National Health hospitals, or alternatively, officials of that Department with military experience as officers should be placed on active service. The Minister directed that a meeting should be held with officials of the Department of Pensions and National Health as soon as possible and "these proposals put forward as his recommendation for action".

The meeting took place on 3 October, and apparent agreement was then reached on the hospital question. At all events, the proposed Order in Council was re-drafted in a manner satisfactory to both Ministers, and emerged on 5 October as P.C. 3004.

The significant portion of the preamble now stated simply that "it would be in the public interest if the hospital and treatment facilities of the Department of Pensions and National Health were utilized to the fullest possible extent". A member of the forces on active service requiring hospital or institutional care was to be referred to the Department of Pensions and National Health "in the discretion of the medical officers of the Department of National Defence". While receiving hospital treatment or institutional care under the control and management of the Department of Pensions and National Health, a member of the forces was to remain subject to the laws pertaining to his own service, and on commission of an offence punishable under these laws was "forthwith" to be reported "to such appropriate authority" as might "from time to time be designated by the Department of National Defence", The Department of Pensions and National Health was

* The effective date of his recall was 19 September. He continued to perform special duties in connection with the medical services until appointed Inspector-General on 6 December.

to furnish all records and information required by the Department of National Defence. "For the purpose of carrying out the provisions of these Regulations", the Ministers of the two Departments were "authorized to make such Orders" as were "mutually arranged, and . . . from time to time required". The cost of treatment or care furnished by the Department of Pensions and National Health was to be chargeable against the funds provided under the War Appropriation Act, 1939.

This Order in Council, in principle, left the control of military patients firmly in the hands of the R.C.A.M.C. But the precise interpretation to be placed upon it, in terms of the extent to which military hospitals were to be operated, occasioned some further difficulty.

The Deputy Minister of Pensions and National Health, Dr. Wodehouse, raised a number of objections to the detailed instructions that, upon the approval of the Minister, the Adjutant General proposed to issue under the provisions of P.C. 3004. The tenor of these objections was that the R.C.A.M.C. should establish new hospitals only to the extent required for training, and should continue to refer the majority of patients to the Department of Pensions and National Health. He expressed the opinion that personnel of field ambulances and casualty clearing stations could receive all the training they required in camp or station hospitals, and that if general hospitals were mobilized only one or two at a time, it would be possible to provide unit administrative training and working experience for operating teams in hospitals operated by the Department of Pensions and National Health.

The one thing that we are anxious about is that general hospitals be not set up and maintained by one National Defence group after another while we have vacant beds in our institutions or while we could create beds in the grounds of our present institutions which would be infinitely more economical to administer after the war for pensions purposes. . . .

As a postscript, Dr. Wodehouse pointed out that the Adjutant-General's prepared statement of hospital accommodation available to the Department of Pensions and National Health was short "nearly two thousand beds". He appended a corrected one, showing 3638 beds immediately available and 440 beds in buildings about to be taken over or constructed, a potential total of 4078 exclusive of beds contracted for in various civilian hospitals. This was in marked contrast to the 420 beds estimated as the total capacity of active military hospitals at this date.

This communication was not well received in the Department of National Defence. "It appears to me", wrote Major-General Ashton to the Adjutant General, "that we must concentrate every effort to obtain from our Minister a decision as to policy".

The military units now on service were mobilized on or about the 1st of September. A month and a half has now passed in which, although they are under full pay and allowances, little or no training has taken place. This money is, to a large extent, being wasted, and the personnel of these units are becoming discouraged.

A very large number of protests have come in from representative persons across the whole of Canada against the policy . . . assumed by the Department of Pensions and National Health that all military patients should be treated in their hospitals. The sooner the matter is set at rest the better...

With most of the detailed suggestions made by Dr. Wodehouse, he expressed disagreement, particularly with the proposal to train military personnel in hospitals of the Department of Pensions and National Health: "I am convinced it will not work". As regards the revised statement of hospital beds: "it would appear that this great expansion in Department of Pensions and National Health hospitals has taken place recently, and it would be interesting to know the basis for this enlargement". It may be noted that at 31 March 1938, the last date for which official figures are available, the Department of Pensions and National Health had 2620 beds in departmental hospitals.

The Department of National Defence now proceeded to settle the hospital problem without further reference to the Department of Pensions and National Health. At the request of the Adjutant General, Major-General Ashton drew up a policy statement on military medical arrangements in Canada. This was formally submitted to the Minister on 23 October after a conference with him earlier in the day, and was approved two days later. In the form of a circular letter it was sent out to all district officers commanding on 26 October. On 28 October the Deputy Minister of Pensions and National Health was provided with a copy.

The instructions thus issued "to cover medical arrangements for the defence forces in Canada during the war" had been brought partly into line with the interpretation of P.C. 3004 desired by the Deputy Minister of Pensions and National Health, but not entirely so. It was pointed out that although the facilities of that Department were to be utilized to the fullest possible extent, the discretionary powers in this respect were vested in the medical officers of the Department of National Defence. The R.C.A.M.C. would continue to function in accordance with existing military regulations, provided that cases requiring lengthy periods of hospital treatment were to be turned over to the Department of Pensions and National Health. The Department of National Defence would remain responsible for all military casualties, would have the right to visit and inspect them wherever hospitalized, and would arrange to provide officers for the enforcement of discipline. All military or station hospitals forming a normal part of the R.C.A.M.C. organization were to continue to operate at their full capacity for naval, military, and air force patients, and were to employ such staffs as might be required. Where troops were centralized in large numbers, new camp or station hospitals were to be organized and operated in close proximity for the reception and treatment of such cases. The medical units already on active service, or subsequently placed on active service were to be utilized for this purpose in such strengths as might be required,

thereby providing a means of training them for their duties, obtaining an immediate return for the pay and allowances now being provided, enabling the Department to

provide quarters and rations for the personnel at a much lower cost than at Present in force, and reducing the cost of transportation and of the treatment of minor medical and surgical cases.

Cases of very serious nature, of probable long duration, or for whom the necessary diagnostic or treatment facilities were not available in these units, were to be handed over to the Department of Pensions and National Health, as were all casualties in areas where it was not considered economical to establish a military medical service over and above a few detention beds for minor ailments. The freest possible use, coincident with efficiency, was to be made of the laboratory and other technical equipment that the Department of Pensions and National Health could provide.

The policy thus outlined was to "apply equally to the medical services furnished to the Royal Canadian Navy and Royal Canadian Air Force". It, was emphasized that "costs must be kept at a minimum". Though authorized in principle, no new military hospital of the camp or station type was actually to be established in any locality without the prior approval of National Defence Headquarters.

P.C. 3004 stipulated that military personnel in hospital were to remain subject to the laws of the service to which they belonged, and that anyone committing an offence punishable under these laws was to be reported to the appropriate authority designated by the Department of National Defence. It was pointed out by the Judge-Advocate-General that even in these circumstances an offence could be dealt with legally only by an officer, who under the laws of the service to which the offender belonged was his commanding officer, or by a court martial, and that the mere designation of an "appropriate authority" would not in itself clothe that authority with the requisite disciplinary powers.

With all three services involved, an appreciable delay occurred in deciding what was to be done about this legal difficulty. In the interval, there was accumulating evidence of lax discipline among military patients under the control of the Department of Pensions and National Health, even though that Department had agreed, on the suggestion of the Adjutant General, to concentrate such patients in separate 'military wards'. On 14 November, as a temporary expedient, district officers commanding were instructed to post a combatant officer not below the rank of captain to each hospital directly operated by the Department of Pensions and National Health. He was to enforce discipline among army personnel both in the hospital to which he was posted and in neighbouring civil hospitals under contract to the Department of Pensions and National Health, and for this purpose was to be given the powers of a Commanding officer. Where army personnel were hospitalized in civil hospitals some distance from those directly operated by the Department of Pensions and National Health, the commanding officer of the unit to which such personnel belonged was to be responsible for ensuring that any necessary disciplinary action was promptly taken.

A solution satisfactory to all concerned was eventually evolved, and embodied in P.C. 3988 of 5 December. The Minister of National Defence was thereby empowered, with effect from 14 November, to appoint any officer of the three services to deal with offences committed by members of the forces while receiving hospital treatment or institutional care under the control of the Department of Pensions and National Health. An officer so appointed was to be deemed to have the powers of a commanding officer irrespective of the service to which he or the offender belonged. These powers were of course to be exercised only within the normal limits prescribed by the disciplinary laws relating to each service.

THE INITIAL OVERSEAS MEDICAL COMMITMENT

Meanwhile, decisions had been reached that involved the early dispatch overseas of ten R.C.A.M.C. units.

The 1st Division of the Canadian Active Service Force, hereafter referred to simply as the 1st Canadian Division, was the logical choice as the token overseas force and on 17 October the Cabinet decided that it would depart early in December. Nos. 4, 5, and 9 Field Ambulances and No. 3 Field Hygiene Section formed its medical component initially. But following instructions of 1 November that all units of the Division were to be brought up to full war establishment in personnel, it became necessary to substitute No. 2 for No. 3 Field Hygiene Section. The three field ambulances experienced no difficulty in completing their establishments. No. 4 Field Ambulance mobilized at Fort William, No. 5 at Hamilton, No. 9 at Montreal, and No. 2 Field Hygiene Section at Toronto. No arrangements had yet been made to provide any non-divisional medical units, even though it was pointed out in a study made of the whole problem by the Canadian General Staff that if the essential ones were not provided by Canada, their functions would have to be performed by British units.

Major-General Ashton, at the request of the Minister of National Defence, made a separate study of Canadian overseas medical requirements, especially in hospitals. His conclusions, reached in consultation with the Adjutant General and the staff of the Directorate of Medical Services, were in substance as follows.

In order to ensure a complete and properly balanced army medical organization overseas, one casualty clearing station, one advanced depot medical stores, one motor ambulance convoy less an ambulance section, one neurological casualty clearing hospital, three general hospitals, and one convalescent depot should be provided over and above the medical units forming an integral part of the 1st Canadian Division. This number of hospitals, it was estimated, would provide beds for ten per cent of the Canadian overseas force, the required ratio determined by the British as a result of long experience. The neurological unit, a projected innovation in Canadian

military medicine, was strongly recommended as a means of providing early treatment for functional nervous disease and traumatic nerve lesions. With a capacity of 250 beds, it was intended to function for this special purpose in much the same way and in the same battle area as an ordinary casualty clearing station. Of the three general hospitals, one was to staff and operate a 300-600 Canadian Red Cross Hospital at Cliveden, the estate of Lord Astor near Taplow, Buckinghamshire. The two other general hospitals, one of 1200 and one of 600 beds, were intended for service in either France or England.

The Minister held a series of conferences with Major-General Ashton and the Adjutant General to discuss these proposals. The decisions reached were then embodied in a formal submission on the policy to be adopted for the care and treatment of sick and wounded personnel of the Canadian Active Service Force overseas. This was presented to the Minister on 20 November. The question, it was stated, resolved itself into a choice between two alternatives: either the care and treatment of all Canadian casualties rearward of field ambulances were to be under arrangements and facilities provided by the British Government through normal R.A.M.C. organization (including the provision of hospital facilities, except for the accommodation at Cliveden), or Canada would have to dispatch overseas the normal complement of army medical units required. Assuming, it was stated, that the British authorities would be willing to undertake such a great responsibility, which they had not yet been asked to do, adoption of the first alternative would ensure proper care and treatment for Canadian casualties, in view of the recognized efficiency of the R.A.M.C. But such a policy would not appeal to Canadian soldiers: "experience in the last war shows that Canadian sick and wounded prefer to be cared for by their own people and friends, and the value of the moral effect should be taken into consideration". Nor would the Canadian public be likely to accept it without protest: "a general public demand for the provision of Canadian military hospitals to care for Canadian sick and wounded would be the outcome, and would develop in very definite form". To adopt the first alternative would seriously undermine the morale of the R.C.A.M.C., and might well mean its disappearance after the war. Finally, the establishment of Canadian hospitals overseas would facilitate the keeping of documents and records required for pension purposes, "which might be expected to work to the advantage of the ex-service men as a whole and of the taxpayers generally". The adoption of the second alternative was recommended.

The medical units additional to those of the 1st Canadian Division that it was proposed to provide at once to implement this recommended policy were one casualty clearing station, one neurological casualty clearing hospital, one advanced depot medical stores, one general hospital (1200 beds), and one convalescent depot. The other units originally recommended by Major-General Ashton, a motor ambulance convoy and a general hospital (600

beds) had been excluded from the list in order to reduce the amount of the financial commitment, the former until such time as a Canadian Corps should be formed, the latter pending the arrival of the 1st Canadian Division in the theatre of operations. The estimated net cost of maintaining the remainder overseas for a period of nine months from 1 December was \$1,075,704, a sum for which no provision had yet been made. Despite this potential cost, the only other unit that might possibly have been dispensed with was the neurological casualty clearing hospital. Yet, "medical opinion in support of the need for such a hospital" was "so strong", it was pointed out, that its retention was hardly open to dispute. The Minister of National Defence on 21 November obtained Privy Council approval of the Adjutant-General's formal recommendation as to overseas medical policy, on the basis of an additional financial commitment of \$1,000,000.

The units selected by the D.G.M.S. to meet this new commitment, apart from the neurological casualty clearing hospital, which was finally designated No. 1 Neurological Hospital, were No. 4 Casualty Clearing Station, No. 5 General Hospital (600 beds to operate Cliveden), No. 15 General Hospital (1200 beds), No. 1 Advanced Depot Medical Stores, and No. 1 Convalescent Depot. Orders to bring them up to full war establishment were issued on 21 December. No. 5 General Hospital had a strength of 41 against a war establishment of 225, and No. 1 Convalescent Depot had not even begun to mobilize. Subsequent developments made it appear doubtful for a time whether many would leave Canada in the immediate future. No. 1 Neurological Hospital, it was found, could not be organized in time to proceed with the third flight. Early in January, Canadian Military Headquarters intimated that No. 5 General Hospital should not be dispatched until March, as accommodation at Cliveden would not be available for 600 beds before 1 June or even for 300 beds before 1 April, and that for No. 15 General Hospital there was neither accommodation nor any immediate need. As arrangements for the necessary shipping had already been completed, it was decided that all but No. 1 Neurological Hospital would sail with the third flight as planned, with the qualification that nursing sisters would be retained in Canada for the time being.

THE PROBLEM OF MEDICAL EQUIPMENT

One of the understandings reached between the Canadian and British authorities with respect to the 1st Canadian Division was that its equipping would be completed in the United Kingdom on a repayment basis. The acute shortage of medical equipment in Canada made it necessary to rely completely on British sources of supply for the whole of the Division's field medical equipment.

The D.G.M.S. repeatedly endeavoured to secure action in this direction and was strongly backed by Major-General Ashton. But for some unexplained

reason there was no communication with the British authorities on the subject of medical equipment until the War Office inquired in the middle of November whether medical units of the 1st Division would arrive in the United Kingdom complete both in personnel and equipment. Canadian Military Headquarters was then informed that medical equipment would be required for three field ambulances, one field hygiene section, 12 infantry battalions, four artillery regiments, one divisional engineers, one divisional army service corps, one divisional headquarters, and one anti-tank regiment, and that it should be ready for issue when the troops arrived. At first the War Office proved understandably hesitant about accepting the responsibility, but it was finally agreed that so far as possible the medical needs of the Division would be met from the British sources upon its arrival in the United Kingdom. Canadian Military Headquarters cabled this reassuring information to Canada on 29 November.

For the movement overseas, it was arranged that five boxes of assorted medical equipment and supplies would accompany each 1000 troops. These boxes, each set of five a combination of several types normally issued for sea voyages or field use, were to be taken to the concentration area in the United Kingdom and retained there until the British equipment became available. They were then to be returned to Canada.

With divisional requirements in medical equipment thus provided for, the relatively small amount needed by the non-divisional units other than medical presented no great problem. The D.G.M.S. reported on 29 December that field medical equipment for such of these units as were entitled to it, those having regimental medical officers attached, was available in Central Medical Stores. With the concurrence of the Adjutant General, arrangements were therefore made to have it shipped in bulk with the third flight for issue in the United Kingdom.

To equip the non-divisional medical units, especially the casualty clearing station, the two general hospitals, and the neurological hospital, was an entirely different matter.

As regards their ordnance equipment, which was not a medical problem strictly speaking, everything required was to be supplied from Canada, with the exception of tentage and a few minor items that could more conveniently be obtained in England. The necessary contract demands were not issued, however, until the early part of January 1940. Actual provision had thus to await delivery from the contractors and subsequent shipment overseas.

Similar arrangements were made initially for the provision of the medical equipment and supplies required by these units. It was soon found that some items, such as surgical instruments and appliances, were not obtainable in Canada, and that Canadian firms were tendering on such articles in expectation of obtaining them either in England or the United States. The D.G.M.S. took up this problem with the War Supply Board on 10 January pointing out in particular that if the necessary instruments could

not be delivered it would "mean that the surgeons and medical personnel of the military medical units" would "not have sufficient equipment to carry on their duties". The eventual result was Privy Council authority for the War Supply Board to purchase through the Ministry of Supplies in the United Kingdom, "hospital equipment and supplies" to the amount of \$20,850 for delivery there to No. 1 Advanced Depot Medical Stores.

MEDICAL EXAMINATIONS AND RELATED PROBLEMS

The troops called out on service as a precautionary measure on 26 August were examined by their own medical officers. When the Canadian Active Service Force was authorized on 1 September, the previously prepared plans for establishing medical boards were immediately put into effect in each military district. Within two or three days, according to the war diaries of the district medical officers, boards were functioning in all the principal urban centres in sufficient number to handle the initial flow of recruits. They were gradually established in smaller towns and cities as well, in conjunction with local recruiting centres. Travelling medical boards were organized to tour the less thickly populated areas. Medical officers of the Royal Canadian Naval Volunteer Reserve carried out the examination of recruits to the Navy, but the army medical boards were responsible for examining all applicants for enlistment in the R.C.A.F. Where warranted district medical officers organized separate boards for the latter purpose even before general mobilization was ordered.

There is little evidence of any major difficulty during the initial recruiting period, even though in addition to new recruits all members of the Permanent Force had to be examined as well as those of the N.P.A.M. joining the Canadian Active Service Force. The problem of personnel was satisfactorily overcome in most instances by the employment of civilian practitioners and non-mobilized medical officers of the N.P.A.M. The accommodation allotted to medical boards was in some cases open to criticism, despite the fact that they were given preferential treatment. Another problem was the uneven flow of recruits. On one day more might appear than could possibly be examined, while on another there might be too few to keep a board busy. Such difficulties were isolated. On the whole, medical boards functioned during the first weeks of the war much more smoothly and efficiently than was to have been expected in the light of pre-war medical planning.

Nevertheless, not only the sufficiency of the examination but the efficiency of the examiners came into question at an early date. The Department of National Defence was by no means satisfied that the scope of the examination had been broad enough. The Department of Pensions and National Health inclined to the view that many had been enlisted who should have been rejected. Both came independently to the conclusion that all Canadian Active Service Force personnel should be medically re-examined, at least

before proceeding overseas. With Major-General Ashton acting as an intermediary between the two Departments, mutual agreement was soon reached as to the scope of the re-examination, and on 23 October the orders necessary to effect it were issued.

Conducted under district arrangements, either by unit medical officers or by medical officers especially detailed for the purpose, it was a complete examination as laid down in *Physical Standards and Instructions for the Medical Examination of Recruits*, 1938. In addition, a chemical urinalysis for sugar and albumin was done, and if albumin were found, a microscopic examination was also done. There was a thorough auroscopic examination. Gross variations from the weight or other particulars recorded at the initial examination were investigated; if considered necessary, specialists' reports were obtained. The nervous system was carefully checked, with special attention to pupillary, knee, and ankle reflexes. If the record of the original examination were corroborated, the urinalysis negative, the ears healthy, and the reflexes normal, a notation to this effect was made in the medical documents. Any discrepancies between the results of the two examinations were also recorded, and if it appeared that the category should be lowered, the case was referred to a full medical board. Officers were required to take a colour vision test.

Complementary to this new physical examination, a chest x-ray programme was launched on 25 October under the direction of a consultant radiologist appointed to the staff of the D.G.M.S. during September. In order that the survey might be completed quickly, the facilities available in the Department of Pensions and National Health hospitals, in civil hospitals, and in the offices of civilian radiologists were depended on almost entirely. District Medical Officers were responsible for obtaining the opinion of a specialist in tuberculosis on all films reported by radiologists as showing pulmonary tuberculosis or other pathological conditions of a nature sufficient to warrant discharge from the service. Discharge proceedings were instituted whenever radiologist, specialist in tuberculosis, and medical board were in agreement as to the necessity. Every effort was also made to reach an early decision about doubtful cases, but in many instances this had of necessity to be postponed pending the results of a further x-ray examination after the lapse of an appropriate interval of some two months. Once films had served their immediate purpose, they were sent to Ottawa for storage.

The number of discharges in the Canadian Active Service Force for medical reasons up to the end of December 1939 was 2397; this indicates that the physical re-examination and the chest x-ray programme disclosed a number of unfit personnel who had passed the initial medical examination. This figure justified the adoption of these two measures. Moreover, it is probable that many of those found unfit in 1939, especially those with tuberculosis, are reflected in the 1940 statistics because of the delay in the returns.

It is worth noting that the discharge rate for tuberculosis dropped appreciably in 1941 when x-rays were performed at the initial examination.

Unfortunately, some of those who were discharged as a result of these additional medical procedures experienced a certain amount of hardship through having given up their civilian employment in expectation of serving for the duration of the war. With a view to the future elimination of such an undesirable situation, instructions were issued effective 30 December that the full medical examination in its amended form, including a chest x-ray, was to be carried out at one time if possible. If x-ray equipment were not immediately available, or if the results of the x-ray examination could not be determined immediately, proceedings for the appointment of officers or the attestation of other ranks were to be completed on the basis of medical board findings alone, but on the understanding that retirement or discharge would follow an unsatisfactory chest x-ray report.

So far as medical categories were concerned, the pre-war instructions were modified very little during this period. It was realized almost as soon as recruiting began that the vision requirements for the various categories were too high, and with effect from 9 September medical boards were instructed that prospective recruits in possession of glasses correcting their vision to the required standards were to be categorized "AV", "BV", or "CV" if they were acceptable in all other respects. Such personnel became eligible for enlistment only to a limited extent, as they were specifically excluded from serving in field units. Apart from this minor relaxation, the medical standards for the Canadian Active Service Force remained at their original high level until about the middle of 1940. To the extent that recruiting was a problem during the first months of the war, this was one of the contributing factors.

The absence of any programme of remedial treatment for prospective recruits, not introduced until 1942, had a similar effect, though it is admittedly open to debate whether such a scheme was necessary or even desirable at a time when a large overseas force was not envisaged. The early provision of remedial treatment was not altogether avoided. Among the personnel actually enlisted, a number had latent disabilities that required only a period of active service to bring them into evidence. Some were no doubt concealed, but others were unsuspected by the individual and of a type difficult or impossible for a medical board to detect. The medical officers called upon to treat such cases frequently concluded that surgical intervention was desirable if not essential.

What was to be done about these cases was the subject of much discussion not only within the Department of National Defence but also between that Department and the Department of Pensions and National Health. On 25 November, to clarify the situation, an order was issued that unless admission to hospital appeared urgent, medical officers were to consider

whether the disability requiring operative interference had been incurred or aggravated on service. If the condition of the patient would not be adversely affected, and if the proposed operation were other than of a trivial nature, a medical board was to be convened to determine the issue. Operations proposed for patients after their admission to hospital, unless trivial or urgent and clearly for conditions resulting from or aggravated by service, were not to be performed without the concurrence of the district medical officer or his representative. "As a general rule", the order concluded, "District Medical Officers or Members of a Board should not recommend operation unless the disability requiring such operation has occurred on or has been aggravated on Service."

MOVEMENT OF THE EXPEDITIONARY FORCE OVERSEAS

The first body of Canadian troops to proceed to the United Kingdom was the small party of officers and other ranks who on 16 November established a Canadian Military Headquarters in London. This included Colonel R. M. Luton, who as Senior Medical Officer was to ensure satisfactory medical arrangements in the United Kingdom and institute the preparations necessary for the care of battle casualties.

An advance party of the 1st Canadian Division, representative of all its major components, sailed from Montreal on 24 November, together with a small number of officers and other ranks scheduled to attend courses of instruction in the United Kingdom. Major troop movements began on 4 December; and during the four days immediately following, the units and headquarters constituting the first flight of the 1st Canadian Division entrained at various points throughout the Dominion. Embarkation at Halifax began on 7 December with the arrival of the first troop train, and on 10 December the five transports steamed out of the harbour under strong naval escort. No. 9 Field Ambulance sailed with this flight on the *Aquitania*, No. 2 Field Hygiene Section on the *Empress of Australia*.

The crossing of the North Atlantic took the best part of seven days. In general, conditions appear to have been satisfactory. The weather was mild, and there was little seasickness. Physical training parades, lectures, and boat drill were the main activities in the daily routine, with concerts and other forms of social activity serving to relieve the monotony. Only two incidents marred the even tenor of the voyage. The *Empress of Australia* became separated from the convoy in a thick fog on the night of 12-13 December, and remained separated for three days. Early in the morning of 17 December the *Aquitania* narrowly escaped disaster in a collision with the *Samaria*, outward bound from England, but fortunately no serious damage was done to either vessel.

The excitement produced by the collision was far surpassed by that which developed at daybreak with the sight of land as the convoy moved up

the Clyde towards its anchorage. Disembarkation began on the afternoon of 17 December, but was not completed until the following day. The units landed, some at Greenoch, some at Gourock, and a few at Glasgow. As they came ashore, they were hurried into waiting trains; and as soon as each train was filled, it set off on the long, tedious journey to Aldershot. At the detraining point, units were met by guides and conducted to their allotted barracks, the two medical units to the Haig Lines, Crookham Camp.

The convoy bearing the first flight had hardly dropped anchor in the Clyde when the remaining units of the Division began to entrain for Halifax. Embarkation began on 18 December, and the seven transports of this second flight sailed on 22 December as scheduled. No. 4 Field Ambulance was aboard the *Reina del Pacifico*, while the *Andes* carried No. 5 Field Ambulance.

The experiences of the second flight were little different from those of the first, except that conditions on some of the transports were far from satisfactory as none of them had been built for the North Atlantic service. That Christmas was spent at sea did nothing to improve the situation, even though every effort was made to provide seasonable cheer. A welcome anchorage in the Clyde opposite Gourock was reached during the morning of 30 December, whence the *Reina del Pacifico* and another transport continued up the river to Glasgow. Shortly, all members of the second flight found themselves in Aldershot comparing notes with the 'veterans' of the first.

While the 1st Canadian Division gradually accustomed itself to the environment of Aldershot, plans went forward in Canada for the dispatch of the ancillary troops. Embarkation took place late in January on four of the ships that had taken the first flight overseas. The voyage began on 30 January in a heavy sea. This time, among other units, the *Empress of Australia* carried No. 1 Convalescent Depot, the *Aquitania* No. 1 Advanced Depot Medical Stores, the *Empress of Britain* No. 4 Casualty Clearing Station and No. 15 General Hospital, and the *Monarch of Bermuda* No. 5 General Hospital. Although the *Empress of Australia* again lost the convoy for a brief period, the voyage was relatively uneventful. Disembarkation along the Clyde began on 8 February, and was completed the following day. As they reached the Aldershot area, the medical units of this third flight were directed to Guadeloupe Barracks, Bordon Camp. Their arrival brought the number of R.C.A.M.C. personnel overseas to a total of 113 officers and 1248 other ranks. All nursing sisters had been retained temporarily in Canada.

The administrative medical arrangements for the movement of the expeditionary force overseas were in principle the same for each flight and generally speaking entirely satisfactory. At least one medical officer, with equipment and supplies, travelled with every train carrying more than 150 troops to deal with such illnesses or injuries as might occur en route. At Halifax there was an embarkation medical officer, whose chief functions were to assist in the inspection of the transports before and after embarkation and

to ensure that sufficient medical supplies and personnel were available on each. In addition, he was responsible for meeting all troop trains, arranging for the admission to hospital or other disposition of any sick or injured personnel, and sending back to the point of origin the medical equipment and supplies issued for use on the trains. For each troop transport, a senior medical officer was appointed by the embarkation medical officer. Normally the senior R.C.A.M.C. officer on board was selected, but to make one available it was necessary on occasion to detach medical officers from their units. A qualified surgeon was also detailed for duty on each ship.

Broadly speaking, the medical equipment and supplies provided for the sea voyage proved ample in quantity and selection, though various suggestions were subsequently made as to desirable additions. Apart from seasickness, upper respiratory infections consequent upon having large numbers in rather restricted quarters were the chief ailments. One emergency operation was successfully performed by officers of No. 9 Field Ambulance, another by those of No. 5. No. 9 Field Ambulance had to deal also with some 200 cases of food poisoning aboard the *Aquitania* while lying off Greenock just prior to disembarkation.

THE CANADIAN SCENE, 1940-1945

Most of the major medical developments in the Royal Canadian Army medical Corps in Canada during the first four months of the war have already been discussed. The expansion of the Corps itself, and the many and varied problems peculiar to the home front and the developments and innovations subsequent to 1939 will be dealt with in this chapter.

D.G.M.S. DIRECTORATE

At the outbreak of the war in September 1939 the Directorate of Medical Services consisted of four officers and three other ranks. As early as 1936 an expansion had been planned but it was not until 10 September 1939, when it was re-submitted by the D.G.M.S., Colonel J. L. Potter, that approval was obtained. The new establishment called for a deputy director and two staff officers, one of whom would be responsible for the medical services of the R.C.A.F. The directorate was further augmented by the formation of six army medical departments (A.M.Ds) each with definite functions to perform. A.M.D. 1 (administered by the deputy director) was made responsible for mobilization, training, personnel, and establishments; A.M.D. 2, hospitalization; A.M.D. 3, procurement and issue of supplies and equipment; A.M.D. 4, nursing services; A.M.D. 5, hygiene and sanitation; and A.M.D. 6, dental services. In December when the Dental Services set up their own directorate, A.M.D. 6 was made responsible for R.C.A.F. medical arrangements. By March 1940 all departments were functioning and the strength of the Directorate was 27 officers and 32 other ranks.

The rapid expansion of the Air Force plus the proposed Empire Air Training Plan necessitated the formation, in September 1940, of a separate medical service of the R.C.A.F.* The R.C.N. had a naval medical service in existence during the First World War and was able to maintain sufficient medical officers on the volunteer reserve list to be able to take over the care of all naval personnel shortly after the outbreak of war. The officers were administered by Surgeon-Commander A. McCallum who worked in close liaison with the D.G.M.S. and, on the re-establishment of a separate Naval Medical Service in October 1941, †became the first Medical Director General, Naval Medical Services.

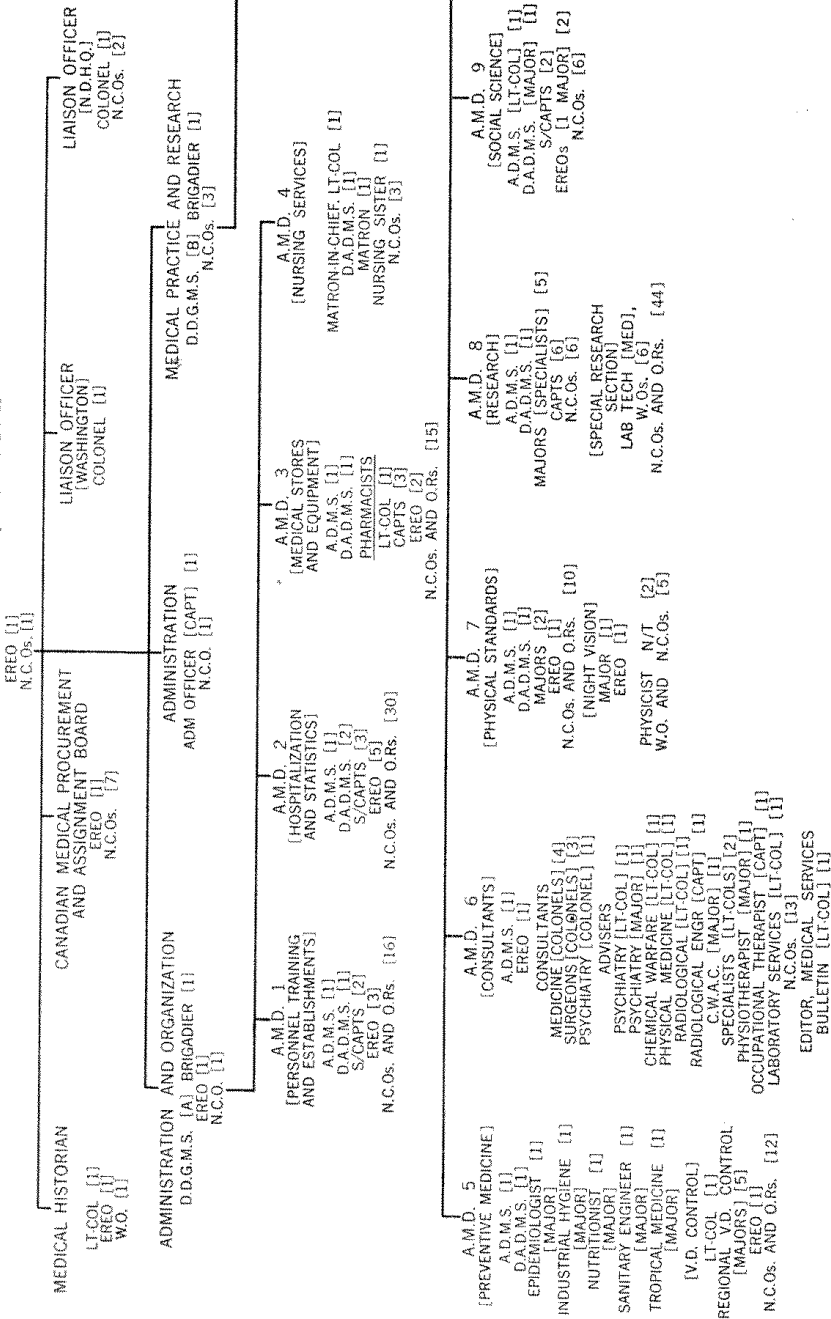
During 1941 further development in the D.G.M.S. Directorate took place. At the time of his original proposals for expanding the Directorate, the D.G.M.S. had requested the formation of a consultant department and an inspection department. The establishment of these two departments was

* P.C. 4437, 13 September 1940.

† P.C. 54/8400, 29 October 1941.

DIRECTORATE OF ARMY MEDICAL SERVICES, NATIONAL DEFENCE HEADQUARTERS [AS AT 17 JUL 45]

DIRECTOR GENERAL OF MEDICAL SERVICES [MAJOR GENERAL]



TOTAL OFFICERS 104
 TOTAL O.Rs. 188
 GRAND TOTAL 292

NOTE: EXTRA-REGIMENTALLY EMPLOYED OFFICER: [EREO]

approved in principle although the Adjutant General felt that the formation of an inspection department could be held in abeyance until the number of hospitals warranted it. The consultant department was formed soon after the outbreak of war. In June 1941 the inspection department was organized and became known as A.M.D. 8. Meanwhile the duties of A.M.D. 2 had so increased that it was necessary to form a new department known as A.M.D. 7 which was responsible for the review of all medical boards. The consultant department was expanded by the addition of travelling consultants in medicine and surgery and was made a sub-division of the directorate known as A.M.D. 9. In 1943 still another department was formed. It was set up to co-ordinate and develop medical research and was known as A.M.D. 10.

Probably the greatest reorganization of the Directorate of Medical Services took place during the autumn of 1942, when it was divided into two separate branches; an administrative branch and a professional branch. The D.G.M.S. remained as chief executive officer of the Corps but under the new plan he had as his assistants two deputies, one in charge of administration and the other in charge of all professional matters. The Adjutant General, Major-General H. F. G. Letson, who was one of the foremost advocates of the professional advancement of the Corps and who had much to do with the reorganization suggested that Dr. J. C. Meakins of McGill University should be appointed as deputy director in charge of all professional matters. Dr. Meakins accepted the appointment on 7 September 42 in the rank of Brigadier. On the same date Lieutenant-Colonel G. A. Winfield of the medical staff at C.M.H.Q. was appointed deputy director in charge of administration in the rank of Colonel. At this time the D.G.M.S., Brigadier Gorssline, was transferred to the inspection department and Brigadier (later Major-General) G. B. Chisholm was made D.G.M.S. Under the new organization and new leadership the Directorate of Medical Services appears to have established a better balance between professional and administrative activities.

The D.G.M.S. Directorate reached its peak strength in 1945. It then consisted of nine departments, A.M.D. 10 having been redesignated A.M.D. 8 just prior to this time. A.M.D. 6, formerly concerned with the R.C.A.F. and later with embarkation, had now become responsible for the consultant service. The total strength numbered 104 officers and 188 other ranks, making a total of 292 personnel.

CONSULTANT SERVICE

Probably no other single effort of the R.C.A.M.C. during the Second World War occasioned more discussion than the professional advancement of the Corps. During the early years of the war some of the most influential men of the medical profession felt that the R.C.A.M.C. was not being administered with due regard to its prime object which was the care of sick

and wounded soldiers, and that executive details outweighed its purely professional aspect. Even in retrospect it is difficult to weigh the facts and to say with any authority that the professional side of the R.C.A.M.C. was neglected. In the pre-war planning phase professional advancement was not wholly forgotten. The D.G.M.S. in his proposals for expansion requested a consultant department. In September 1939 consultants in neuropsychiatry and radiology were added to the Directorate of Medical Services. Vacancies existed for similar appointments in medicine and surgery but difficulties were experienced in filling these appointments. In February 1940 part time consultants in surgery and medicine were appointed and in July the surgical consultant was able to devote his full time to the R.C.A.M.C.

It was not until late in 1942, when the Directorate was sub-divided into professional and administrative branches that any real advancement was made. By that time the government and the people of Canada were fully aware of the magnitude of the war. The First Canadian Army had been formed and the total resources of the country were being thrown into the struggle. Top men of the medical profession were coming forward to offer their services. The medical colleges of Canada were releasing key personnel for service in the R.C.A.M.C. The Directorate of Medical Services was divided into professional and administrative branches and the new deputy director in charge of professional matters embarked upon a policy of developing a consultant service which would engender a close relationship between that service, the district medical officers, and the medical officers in each district. In order to accomplish closer contact with all medical officers the military districts were grouped into four areas with at least one consultant in surgery and one in medicine for each area. The selection of consultants was based on the principle that they should have occupied a prominent place in the medical profession and if possible should be associated with the medical colleges of Canada. In addition to medicine and surgery, consultants were appointed in psychiatry, gynaecology, chemical warfare, and laboratory services. To assist the consultants in carrying out their duties district advisers in all specialties were appointed.

The duties of consultants were: to act as advisers to the D.G.M.S. in all professional matters, to deal with specific problems of a professional character, to advise the D.G.M.S. as to the professional qualifications of his medical officers, and to assist him in the suitable placement of officers working as specialists. They also supervised the quality of the professional work done by all medical officers and selected younger medical officers for further professional training.

The professional training of the junior medical officers occupied much of the consultant's time. It was the policy that training in the first instance should rest on firm scientific principles. Universities and public health departments offered their facilities and expert teaching staffs to give instruction. In anaesthesia a thorough training in the pharmacology of this specialty

was considered essential. It was recognized that these courses would not turn out fully trained specialists, but it was felt that with this basic knowledge they would soon gain clinical experience under more senior officers. Training was given in ophthalmology and otology. Here young officers of high academic standing and showing aptitude for these specialties were given instruction which classified them as prospective graded specialists.

Other young medical officers both from Canada and overseas who had some previous training in medicine, surgery, neurosurgery, or urology were placed in leading clinics in Canada in order that they might receive at least six months extensive training. Other medical officers were given psychiatric training in much the same manner.

SOCIAL SCIENCE

Prior to 1943 social welfare in the armed forces was a haphazard service. Most of the social welfare of the serving soldier was left to the regimental officer, and his attempts to solve the social problems of his men were often blocked by lack of a proper channel of communication between the Army and civilian welfare agencies. Late in 1942 a more or less unofficial arrangement was adopted in the Medical Reception Centre at M.D. 2 whereby local civilian welfare agencies were added to assist the medical board of this centre in securing social and health data necessary for the proper screening of selected groups of recruits. It was felt that the information gathered by these civilian social workers contributed greatly to the proper screening of borderline recruits.

This was a step in the right direction but did little to solve the welfare problems of the serving soldiers. The need for a welfare service was becoming more and more apparent. In March 1943, the D.G.M.S. obtained authority to appoint one social service worker in the rank of lieutenant to each military district and in July 1943 the Adjutant General issued authority to select from the C.W.A.C. additional social workers to be employed where needed. About this time also the Executive Director of the Canadian Welfare Council in a memorandum to the Deputy Adjutant General pointed out that there was no single directorate in the Army "which is clearly charged with the responsibility of handling enquiries from civilian sources on matters of a social welfare nature affecting members of the armed services"; nor was there, "in the various military districts any single source to which agencies may direct all their enquiries". He suggested that one of the Directorates at National Defence Headquarters be designated as the channel of communication between the Army and civilian welfare agencies, or if that was not possible district welfare officers should be appointed.

These proposals were fully discussed and on 6 December 1943 authority was granted to appoint district welfare officers under the control of the Directorate of Auxiliary Services. Thus, by 1944, there were in all Districts

and Commands, 14 district welfare officers, 11 C.W.A.C. social workers, and 11 R.C.A.M.C. social service workers, each working independently of each other and having no central director.

To centralize control and direct the activities of all welfare programmes the D.G.M.S., early in 1944 embarked upon a plan whereby the existing scope of the R.C.A.M.C. would be broadened to include a much larger number of activities, either of a formative or preventive nature that seriously affected — directly or indirectly — the health of the individual or the group. On 26 February 1944, the D.G.M.S. in a memorandum to the Adjutant General drew up a plan in which he proposed to incorporate all welfare activities under D.G.M.S. control by the formation of a new directorate to be called *Personal Welfare*.

The Adjutant General was in favour of transferring some welfare activities to D.G.M.S. control but felt that the name was inappropriate and it was finally agreed that a Directorate of Social Science should be set up under D.G.M.S. control for a trial period of six months.

At the termination of the six month trial period a meeting of the interested military personnel was held and it was unanimously agreed that social science would continue to operate under D.G.M.S. control.

While the discussions leading up to the formation of a Directorate of Social Science under medical control were taking place, the D.G.M.S., Major-General G. B. Chisholm, was exploring the possibility of a much broader and revolutionary plan for the establishment of a "Royal Canadian Army Health Service". He proposed to incorporate into the R.C.A.M.C. not only social science but also personal and social psychology, selective service, and even the auxiliary services. He argued that all these services were primarily concerned with the health of the individual. Although they could not be, strictly speaking, included under the heading "medical" in its commonly accepted sense, he stated that it was "manifestly unfair to subjugate advanced professional disciplines such as psychology, social science, and others to medicine", yet it was of the "greatest importance that these professions should be brought together in the closest possible intimacy under a common name which will signify their common purpose". He proposed to call the new organization the *Royal Canadian Army Health Service (or Corps)*.

This proposal was widely circulated among medical and social welfare agencies across Canada. No adverse comments were recorded. The Canadian medical colleges endorsed it. The Canadian Psychological Association spoke of the proposal as "brilliantly conceived, urgent in its purport, highly desirable in the interest of Canadian public health and psychological welfare". The Health League of Canada, the National Committee of Mental Hygiene (Canada), the Canadian Medical Association, the Ottawa Council of Social

Agencies, and the Canadian Welfare Council, all added their plaudits to the Scheme. The Command and District Medical Officers considered the principles of enlargement of the Corps sound and endorsed the adoption of the title "Royal Canadian Army Health Service (or Corps)".

The proposal was submitted to the Adjutant General who in turn passed it to the Chief of the General Staff. Both were of the opinion that the proposal deserved "careful consideration" but before the plan came up for further discussion its sponsor, Major-General Chisholm, had retired, the end of the war was in sight, and the new D.G.M.S. appeared willing to let the matter drop.

However, General Chisholm's idea of a united health service, although not fully adopted, was closer to realization than is generally understood. Social Science, which embodied all personal welfare, was eventually made part of the D.G.M.S. Directorate. Personnel Selection, which was the psychological approach to the mental health and well-being of the individual, was closely integrated with the medical services, and was for a time directly responsible to the D.G.M.S.* The actual incorporation of the Directorate of Personnel Selection into the R.C.A.M.C. was the subject of much discussion throughout the war years. In fact, only the hesitancy of army authorities overseas prevented this union.† Even then, Canadian authorities at National Defence Headquarters sought the amalgamation of the Directorate of Personnel selection with the R.C.A.M.C. in Canada only. This proposal actually received the Minister's approval on 9 February 1944‡, but to implement it without the co-operation of Canadian Military Headquarters in London, proved difficult. Army authorities in Ottawa were reluctant to finalize the union in Canada as the administrative difficulties involved in having the two services united in Canada but divided overseas would have been enormous. In particular, the posting of officers overseas from Canada, and *vice versa*, would have entailed changes in corps. For these reasons the plan was never carried into effect.

HOSPITALIZATION IN CANADA

The hospital situation in Canada proved to be one of the major problems of the medical services as far as the home front was concerned. There were several factors which contributed to the difficulty in developing a hospital programme. The foremost was the dispute between the Department of National Defence and the Department of Pensions and National Health as to which would be responsible for the hospitalization of the serving personnel. The wide dispersal of troops across the length and breadth of the Dominion, in training centres, in coastal defence areas, and other vulnerable points

* HQC 8173-H, vol 3. D.G.M.S. to Senior Officer C.M.H.Q. 22 April 1943.

† *Ibid*: Tel. A 2404 Letson from Montague, 22 August 1943.

‡ *Ibid*: A. G. to Minister, 9 February 1944

where no civilian hospital existed, necessitated the construction of many small hospitals. There was also the problem of co-ordinating the hospital activities of the three services. The early difficulties experienced during the first four months of the war and the attempt on the part of the Department of Pensions and National Health to control the hospitalization of all service personnel has already been discussed.

The promulgation of P.C. 3004 on 5 October 1939 defined the relative position of the two departments, but differences of opinion still existed as to the practical application of this Order in Council. The hospitalization and care of serving personnel was clearly defined as a National Defence responsibility and it was established that in discharging this responsibility the fullest use was to be made of the hospital facilities of the Department of Pensions and National Health. It appeared that the latter Department felt that its existing hospital facilities should be increased to take care of the rapidly expanding armed forces, while the Department of National Defence strongly contended that any hospital expansion programme should be its responsibility.

Towards the end of 1940 the rapid expansion of both departments' hospital facilities necessitated very strict governmental supervision in order to avoid duplication and to ensure the closest co-operation and co-ordination between the three branches of the armed services and the Department of Pensions and National Health. On 5 December 1940 the Associate Minister of National Defence requested a full review of the medical and hospital services and asked the Adjutant General to assemble a committee to consist of the heads of the medical services of the three armed services and the Director of Medical Services, Department of Pensions and National Health. The committee was convened on 6 December and came to be known as the Inter-Departmental Committee on Hospitalization. It was the Minister's request that the committee report on, among other things, the number of hospital beds then in existence, the number under construction, and the number proposed for future construction with the location and type of facilities available in each case, *

The committee met on 6, 7, and 8 December and, before discussing in detail the points outlined by the Minister, agreed that a clear understanding of the functions and responsibilities of each department was necessary before a full report could be given. For this purpose it outlined its interpretation of P.C. 3004 for the Minister's approval.

The committee interpreted the Order in Council to mean that the "primary function" of the medical services of the armed forces was to Care for the sick and injured members of the service until such time as they are no longer physically or mentally fit to serve. The "primary function" of the Treatment Branch of the Department of Pensions and National Health was

* HQC 8733-1, vol 1.

to provide the necessary medical treatment and hospitalization to veterans of the First World War and all members of the Canadian Active Service Force who were discharged from the service and still required treatment. "The secondary function" of the Department of Pensions and National Health was "to offer hospitalization for cases of the Forces (sic) as cannot be accommodated in the service establishments, when beds are still available in such Department of Pensions and National Health institutions, as are now existent". Having established these principles the committee concluded "that any further expansion of hospitalization for the present treatment of any overflow of Active Service cases, requiring the taking over of extra buildings not immediately part of the existing Department of Pensions and National Health institutions, should be the responsibility of the Department of National Defence, and not that of the Department of Pensions and National Health". It is not certain whether the Minister specifically approved this interpretation of P.C. 3004, but the committee's first report definitely stated that they were working on that assumption.*

That the Department of Pensions and National Health had embarked on an expansion there is no doubt. The committee in its first report showed that the Department had in the process of construction accommodation for 1875 beds and was requesting more. On 2 December the Department of Pensions and National Health had submitted a request to Council to increase the hospital facilities at Calgary "to enable the Department to meet the obligations which will devolve upon it with reference to the treatment of members of the Canadian Active Service Force". On 12 December there was a similar request for a 300-bed expansion to Camp Hill Hospital at Halifax and a 182-bed increase to Lancaster Hospital at Saint John, N.B. Again the tenor of its request implied that the increase was necessary in order to care for serving personnel. These requests, as well as all other subsequent submissions for hospital expansion, were referred to the Inter-Departmental Committee on Hospitalization for consideration. A completely amicable solution was not always effected. The dissension attracted the attention of the Special Parliamentary Committee on War Expenditure which appointed a subcommittee, known as Subcommittee No. 2, to investigate all medical, dental, and hospital services. On 3 November 1941 Subcommittee No. 2 reported as follows:

This division of the duty of taking medical care of men in the armed services as between the Department of Pensions and National Health and the Department of National Defence has been given very serious thought by the sub-committee. In the present war effort, where the whole national machinery has to be mobilized in a common effort for a common purpose, the sub-committee would urge that the executive and administrative heads of the different departments and branches of government recognize the supreme importance of co-operation and co-ordination so that the purpose of the state can be best achieved in the most economical manner.†

* *Ibid.*

† Special committee on War Expenditures, Seventh Report, 3 November 1941.

The subcommittee, taking into consideration the hospital arrangements that existed during the First World War, discussed the hospitalization of personnel in the armed services in terms of three schools of thought, namely: (i) "that the army should only treat patients with minor troubles in small hospitals or first aid stations erected in camps" and that all serious cases be transferred to Department of Pensions and National Health hospitals; (ii) "that a great deal more use could be made of civilian hospitals already in existence, and that these should be assisted to increase their bed capacity in order to serve war requirements;" (iii) that there "should be a clear-cut division of duties between the Department of National Defence and the Department of Pensions and National Health" and that "all Army, Air, and Navy personnel should be treated by the Department of National Defence until such time as they are placed in Category 'E', that is, until they are considered no longer physically or mentally fit for Active Service".

The subcommittee did not consider the first school of thought worthy of comment. In discussing the second school of thought it considered two factors: cost and time. It pointed out that the average cost of a temporary military hospital was from \$500 to \$800 per bed. As regards the time factor it was "easily apparent that the temporary type of hospital" could be "erected and put in operation much more quickly than the permanent type". The third school of thought came in for most discussion and it may be well to record the report:

In support of the above contention (the third school of thought) it is argued that war demands the most effective Army, Air Force and Navy that it is possible to create. The civilian who enlists in any of the armed forces must of necessity give up many civilian rights and become subject to military law in order that the most effective use can be made of man-power for the specific purpose of winning the war. Discipline and morale are two very important factors in the maintenance of an effective military force. It follows, therefore, that the duty of the military forces is to keep their men effective, that is to say, fit mentally and physically, and on active duty, in order that the full strength of our armed forces may be developed and available in case of need.

The Royal Canadian Army Medical Corps is but a part of the whole military system of achieving this end. An enlisted man must live in an atmosphere that will make of him and continue to make of him the most effective unit in the Army, Air Force or Navy. To do this it appears to follow that he must at all times, either sick or well, be under the direct control and care of officers of the armed forces who alone are trained and equipped for this duty. . . .

The subcommittee, while taking into consideration the fact that the Department of Pensions and National Health was longer established and more experienced in the field of medical care and hospitalization than the Military Hospital Commission of the First World War, nevertheless outlined the basic principle that should govern the hospitalization of personnel of the armed forces as follows:

In the opinion of the sub-committee this basic principle is that the medical services of the Department of National Defence should discharge, and be made responsible for, the duty, for which they were created, of taking medical and hospital care of all men in our military forces until such men are placed in Category "E". . . .

The subcommittee noted that if the basic principle as outlined were recognized and adopted, "there will have to be a redistribution of existing hospitals and control thereof as between the Department of National Defence and the Department of Pensions and National Health".

Subcommittee No. 2, also reporting on the duty and responsibilities of the Inter-Departmental Committee on Hospitalization, stated that the greatest possible use was not being made of this Committee and recommended that it be made permanent, hold regular meetings, and have its authority and purpose more clearly defined. The subcommittee further recommended that the personnel of the Inter-Departmental Committee should be enlarged to include a representative of Treasury and a recognized civilian authority on hospitalization and, in order to give direction to such a committee, the Deputy Minister of the Department of National Defence should be appointed chairman. The subcommittee also suggested that on account of its increased representation the name should be changed and that at least the following matters be referred to it:

- (1) The careful survey of the present system of medical and hospital care of men in our armed forces;
- (2) In the event that the recommendation of the sub-committee as to the medical care and hospitalization of our service men is adopted, the redistribution of existing hospital facilities between the Department of Pensions and National Health and National Defence;
- (3) Consideration of all new public hospitals to be erected in Canada or elsewhere;
- (4) Generally the most efficient and economical use that can be made of our hospitals and auxiliary services. *

At a meeting of the Inter-Departmental Committee on 25 May 1942 with the Deputy Minister of National Defence (Army) as chairman and a representative of Treasury as a member, together with all former members, it was decided to change the name to "Wartime Committee on Hospitalization". A secretary was then provided and it was agreed that regular meetings would be held twice a month in the office of the Deputy Minister, Department of National Defence.

The Wartime Committee on Hospitalization dealt with all projects involving additional hospital accommodation and took into account the following factors:

- (a) The primary cost of construction
- (b) The subsequent cost of operation
- (c) The distance from the concentration camp
- (d) The speed of construction
- (e) The type of cases the forces have to treat.

All projects involving the provision of an additional bed capacity of 50 or more were submitted to the Treasury Board for specific approval and such submissions were supported by the detailed estimates of expenditure and the recommendation of the Wartime Committee on Hospitalization. If less than

* *Ibid.*

50 were required the Wartime Committee on Hospitalization could give the final approval without reference to the Treasury Board provided that the estimates of expenditure were within the annual estimates submitted by the service concerned.

Meanwhile the hospital programme of the medical services was progressing favourably. In 1940 training centres were being constructed all across Canada and at each of these centres, if not already served by a military, Department of Pensions and National Health, or civilian hospital, a small camp hospital was erected. These were with a few exceptions small installations staffed by one medical officer who worked in close co-operation with the camp medical officer.

Elsewhere larger hospitals were usually required. By the end of 1940 the Army had 3910 hospital beds in operation, the R.C.A.F. 851 and the R.C.N. 40. Hospital accommodation for more than 2000 beds was under construction. The number of military patients who had received treatment during 1940 totalled 75,618, of which 46,302 or 61.2% were treated in military hospitals. At the end of the fiscal year 1941-42 the D.G.M.S. in his annual report stated that the total bed capacity of all military hospitals was 7030 which represented a total of 94 hospitals ranging in size from 15 to 500 beds.

The recommendations of the Subcommittee No. 2 of the Special Committee on War Expenditure and the increased authority and scope of the Wartime Committee on Hospitalization had, by the end of 1942, produced a better understanding between the Department of National Defence and the Department of Pensions and National Health and the "co-operation and co-ordination" so much desired appeared to have been achieved.

By 1943 it was apparent to the medical services of the armed forces that the severe drain on well trained general duty and specialized medical officers to meet overseas requirements would leave an acute shortage of such personnel in Canada. This shortage was expected to be felt most severely during 1944 at a time when returning casualties from overseas would require the best professional skill that the armed forces could procure. In order to utilize to the best advantage the limited professional manpower available it was proposed to grade all military hospitals in Canada according to their size and function. It was desirable to have one or more, preferably one, central hospital in each District or Command where the most qualified specialists could be brought together and function as a highly skilled professional team. Such hospitals were designated grade "A". It was appreciated that the most suitable location for grade "A" hospitals would be in the vicinity of a Reception Centre but this was not always possible. Then, again, the size and function of hospitals at such large training centres as Camp Borden, Petawawa, and Debert, would of necessity be grade "A" hospitals. On the other hand the medium size training centres would be adequately served by hospitals staffed by well qualified general duty officers

who were capable of undertaking the general run of diagnosis and medical therapy. Such a hospital was designated grade "B". Grade "C" hospitals were no more than "glorified sick bays" for the treatment of minor sickness and injuries. They were usually connected with the smaller training centres. Included in grade "C" were Internment Camp Military Hospitals for the care and treatment of prisoners of war. These and other medical facilities afforded the camps entailed the employment of a large number of R.C.A.M.C. personnel.

The military hospital bed state in Canada reached the peak strength towards the end of 1944 and the beginning of 1945. There were probably more hospital beds in operation during the summer of 1944 but as a large number of these were in grade "C" hospitals and mostly concerned with training centres they should not be included in the peak strength. It was the grade "A" and "B" hospitals that did the main bulk of the hospital work in Canada.

On 21 June 1944 the Wartime Committee on Hospitalization requested A.M.D. 2 to make a complete survey of all governmental hospital accommodation in Canada and the report, submitted on 15 August 1944, stated that there were 7550 grade "A" and "B" military hospital beds in operation with an additional 2075 beds under construction which were expected to be ready by January 1945. Of the 7550 beds in operation, 1175 were on loan from the Departments of Veterans Affairs.* The latter Department had at this time 7551 hospital beds with an additional 2500 under construction.

By 28 February 1945 the total beds available in the three services and Department of Veterans Affairs hospitals numbered 20,909 of which the Army had 8877, the Department of Veterans Affairs 8142, the R.C.A.F. 2645, and the R.C.N. 1245. The 8877 beds under army control were located in grade "A" and "B" hospitals. Grade "C" hospitals including Internment Camp Military Hospitals, Conditioning Centres, and Women's Service Health Centres could not be classified as active treatment hospitals but they did serve to relieve "A" and "B" hospitals of the burden of treating minor illness and convalescent cases. On that basis they should be included in the maximum bed capacity of the armed forces. There are no figures available for February 1945 but a previous report dated 24 November 1944 shows the bed capacity of these installations as follows:

| | |
|--------------------------------------|------------|
| Grade "C" hospita..... | 3315 |
| Conditioning Centres..... | 1600 |
| Women's Service Health Centres | <u>400</u> |
| | 5315 |

The rapid growth of the military hospital programme from 1939 to 1945 is shown in Appendix "B". In September 1939 the total hospital beds

* In October 1944 the Department of Pensions and National Health ceased to exist; its functions concerning war veterans were taken over by the Department of Veterans Affairs.

available was only 420, located in small station hospitals scattered across Canada. They were only equipped to deal with minor surgery and the less serious types of medical cases. By 1944 there were 13,057 hospital beds in operation, many of which were in installations of over 400 beds, equipped to deal with the most advanced type of surgery and staffed by the best surgical and medical specialists in Canada.

Closely linked with the hospital development in Canada was the formation of Conditioning Centres. These were, in a sense, convalescent installations but differed from the pre-war convalescent hospital in that they not only supplied ordinary post-hospitalization care but served as physical development centres for personnel who during training, especially basic training, revealed defects that could be remedied by sound physical training methods. They were also used to recondition personnel who had spent long periods in sedentary occupations. The medical officers at these centres were usually specialists in physical medicine and their assistants were physiotherapists, occupational therapists, and senior non-commissioned officers from combatant corps especially trained in remedial physical training.

The Conditioning Centres although an army project were open to the other services as well as to the Department of Pensions and National Health (later D.V.A.). There were five in all, located at Sussex, N.B., Huntingdon, P.Q., Oakville, Ont., Portage la Prairie, Man., and Harrison Hot Springs, B.C. Later the Oakville centre was transferred to Brampton, Ont., and the Harrison Hot Springs centre to Chilliwack, B.C. as both these original sites were converted into Women's Services Health Centres. The total capacity of all five centres was 1600 beds.

Concurrent with the development of Conditioning Centres for male personnel, much consideration was being given to the formation of similar centres for members of the Canadian Women's Army Corps and female personnel of the R.C.A.M.C. The problems of the female soldier differed from those of the male. Whereas the male soldier was a trainee for active service in every sense of the word, the Canadian Women's Army Corps and other female personnel were on active service within the realm of their employment and the question of retraining during convalescence was not a factor. Therefore, it was decided that health centres with as much home-like environment as possible would best suit the needs of the female personnel.

During the latter part of 1944 two such centres were established, one at Oakville, the other at Harrison Hot Springs. They were officially designated Women's Services Health Centres and were widely used by the three services and the Treatment Branch of the Department of Veterans Affairs. Their purpose was threefold: to supply ordinary post-hospital care for all ranks including nursing sisters, to provide rest, a change of environment and

psychotherapy for personnel who had not been hospitalized but had some minor situational or personality difficulties, and to provide a rest centre for personnel on short leave.

Still another aspect of the hospital programme in Canada was the development of Special Treatment Centres. These were set up in existing hospitals of the Department of National Defence or the Department of Pensions and National Health, which were specially selected as the treatment centres for specific types of injury or disease. To these centres were attached leading specialists in the particular field to which the centre was devoted. The first centre was formed in the summer of 1943 at Christie Street Hospital in Toronto. In the beginning it had no official status, but appears to have been developed on the initiative of plastic surgeons of the medical services of the R.C.A.F. and the Department of Pensions and National Health, who felt that all plastic surgery should be performed at one central hospital so that casualties requiring plastic repair would be assured of the most expert treatment.

The success of this venture led to the formation of a committee to study the idea, and on 1 May 1944 Special Treatment Centres were established in the specialized fields of plastic surgery, neurosurgery, and orthopaedic surgery. The first to be formed were in the Department of Pensions and National Health hospitals at Montreal, Toronto, Winnipeg, and Vancouver. Towards the end of the war other centres were opened for the care of urological, tubercular, and arthritic conditions.

HOSPITAL SHIPS AND TRAINS

Hospital Ships

During the early years of the war the evacuation of casualties from overseas was largely dependent on westbound troopships with occasional assistance from British hospital ships. Although this arrangement was adequate to meet the needs of the small number of casualties during the first years of the war, it was realized that when Canadian troops were committed to battle the number of casualties to be evacuated would greatly increase. Canadian Military Headquarters in London estimated that 10,000 casualties would require evacuation per annum, and that two hospital ships should be provided at an early date.

The first ship to be taken over and refitted as a hospital ship was the *Lady Nelson*. She was put into service early in 1943 and began her first voyage in her new capacity from Halifax on 22 April, arriving in England on 1 May. On her return trip she carried 410 patients-of whom 144 were Americans. It was the policy of Canadian authorities to allot all space not required by Canadian casualties to the United States forces, as the latter had no hospital ships in operation in the Atlantic at that time.



The National Gallery of Canada

HOSPITAL SHIP BERTHED

From a painting by Capt. G. D. Pepper

The Canadian hospital ship "Lady Nelson" at Avonmouth, Gloucestershire, 14 November 1943.

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On her third eastbound voyage the *Lady Nelson* returned to the United Kingdom via North Africa, where she picked up 501 British casualties awaiting evacuation to England. Thereafter she made a regular practice of calling at North Africa, and when Canadians were committed to battle in Sicily and Italy she was able to evacuate most of the Canadian casualties from the Mediterranean theatre to the United Kingdom.

The second hospital ship, the *Letitia*, was put into service in November 1944. She had a greater carrying capacity than the *Lady Nelson*, and on her first voyage she evacuated 745 casualties. On her second voyage she took part in exchange of prisoners of war, taking 547 Germans from New York to Marseilles and repatriating 718 allied prisoners to the United Kingdom.

The *Letitia* was reported to be one of the most modern hospital ships afloat, capable of carrying approximately 700 casualties. She was equipped with two operating rooms, an x-ray department, and all other equipment found in any large modern hospital.

Both Canadian hospital ships continued to evacuate casualties from the United Kingdom to Canada for some time after the cessation of hostilities. It was estimated that the two hospital ships evacuated approximately 28,000 casualties and 2700 prisoners of war. The *Lady Nelson* made 37 voyages across the Atlantic and the *Letitia* nine.

Hospital Trains

In 1940 the Canadian National Railways, at the request of the Department of National Defence, converted a standard sleeping car into a hospital car for the transportation of returning invalids from the port of disembarkation to all parts of Canada. This first hospital car was a compact, well equipped unit, designed to accommodate 16 patients and a staff of five medical attendants. It made its first run from Halifax to Vancouver on 29 December 1940.

Early in 1941 the second hospital car was converted by the Canadian Pacific Railways, and by 1943 two auxiliary cars were in operation. They differed from the original hospital car in that they had no accommodation for a medical staff and this saving in space increased their capacity to 28 beds. The lack of a medical staff made them dependent upon the standard hospital car to which they were attached. In all, 20 hospital or auxiliary cars were put into operation during the war. There was one hospital car specially designed for mental patients.

Not all casualties were evacuated by hospital car as most of the ambulatory cases were carried in standard sleeping cars. The ambulance train therefore consisted of sufficient hospital cars to take off the stretcher cases and the standard sleeping car was used for the ambulatory patients. The medical staff of the hospital cars was responsible for the entire train.

TRAINING

Little effective training was possible during the mobilization phase in 1939. All units of the Canadian Army Active Force were so occupied with the medical examination, documentation, and the procurement of equipment that there was little time to devote to training. During these busy days some success had been achieved in transforming the civilian recruits into soldiers.

On 19 September 1939 the first instructions were issued. Training was divided into two phases; individual and unit training, and unit and formation collective training. In the R.C.A.M.C. individual training consisted of "hardening" or physical development of the recruit, by route marches and squad drill with as much attention as time permitted to driving and maintenance of vehicles, anti-gas training, map reading, and tactics.

By January 1940 Training Centres were being established throughout Canada with the primary purpose of training reinforcements for overseas units and at the same time, or as a secondary function, of conducting short course instructions for Non-Permanent Active Militia officers. The R.C.A.M.C. Training Centre known as A-22 was set up at Ottawa on 13 January 1940 and the first draft for the reinforcements was taken in on 1 February.

This Centre gave both basic and advanced training although in the early stages there was little time allotted to the latter type of training. Lectures on technical subjects, and, to a lesser extent, demonstrations in the employment in the field ambulance were given. No. A-22 also acted as an examining board for the N.P.A.M. officers, although the latter did most of their training under district arrangements.

Early in 1941 Training Centres were re-designated Canadian Army Basic) Training Centre and Advanced Training Centre. By the end of September 1941 there was a total of 60 training centres across Canada. No. A-22 R.C.A.M.C. Training Centre at Ottawa became No. A-22 Advanced Training Centre and in June 1942 the unit moved to Camp Borden. At that time the R.C.A.M.C. had no basic training centre and all recruits received their basic training prior to being allotted to the Corps. It was not until the introduction of the Link Training Plan on 5 August 1943 that the R.C.A.M.C. established its own basic training centre.

LINK TRAINING PLAN

The Link Training Plan — so called because of the corps affiliation it gives to recruits — was introduced to meet reinforcement requirements for the Canadian Army both in Canada and overseas, and to increase the efficiency of training in Canada. It was also intended to foster esprit de corps by having the recruit assigned to a specific corps before his training commenced. The aim of his training was to fit him for the role he was finally

to assume in a field unit in that corps. In general certain basic training centres were linked to specific corps centres. Under this plan the R.C.A.M.C. took over the Basic Training Centre at Huntingdon, Quebec, which was linked with the Corps training centre (A-22) at Camp Borden. This unit was later moved to Peterborough.

TRADES TRAINING

The original plan for providing tradesmen required in the Canadian Active Service Force was to enlist civilian personnel already qualified in their trades and to teach them at depots, training centres, or under unit supervision, the military application of their trade. This system was said to have worked well for the first year of the war, but as the strength of the Canadian Army increased and the demand for tradesmen became greater, the number of qualified tradesmen began to fall below the army requirements. Accordingly, in November 1940, a plan was provided for the training of military personnel who had no previous technical training, whereby existing civil organizations such as the Youth Training Programme of the Department of Labour and the technical schools of the various provincial departments of education could be used. It was also proposed to establish Army Trade Schools to provide more advanced technical instructions to those personnel who had attended technical schools or for personnel who had some technical background. This plan did not provide for any special medical training and was of interest to the medical corps only in that it provided certain tradesmen (i.e. clerks, cooks, carpenters), who were not, strictly speaking, medical tradesmen.

Medical trades training was for the most part the responsibility of A-22 Advanced Training Centre. As the war progressed teaching facilities were gradually improved and special emphasis was placed on the theoretical aspects of the various trades. It was felt that practical experience could be had in the various military hospitals. During 1943 special courses were arranged at various centres for training in certain trades such as sanitary assistants, laboratory assistants, operating room assistants, radiographers, and others. In the case of laboratory assistants use was made of civilian facilities such as the Psychiatric Hospital at Toronto and the Provincial Laboratory of Health at Mimico, Ontario. A School of Hygiene was established as part of A-22 at Camp Borden to provide for the training of sanitary personnel. Radiographers were trained at the School of Radiography at the Toronto General Hospital. Nursing orderlies, who constituted by far the greatest number of medical tradesmen in the R.C.A.M.C., did not present much difficulty as far as trades training was concerned. The facilities of A-22 Training Centre afforded sound theoretical instruction, and practical experience was obtained at the various military hospitals throughout Canada. From 1943 onward medical tradesmen entered the reinforcement stream well versed in their specialty and were able to take their place in any type of medical unit.

OFFICERS' TRAINING

During the early months of the war medical officers did not have a great deal of opportunity to do much training. Recruiting problems, medical boards, and the training of recruits took up most of their time. However, some units were able to arrange to have instructors give their officers lectures on military subjects and some instruction in military drill. No corps training centre was in operation at that time and it was not until January 1940 that A-22 R.C.A.M.C. Training Centre was established. This Centre afforded both basic and advanced training to medical officers as well as to other ranks. It was a six week course and designed to fit the officers for duty as regimental medical officers, general duty officers in military hospitals, or junior medical officers in field ambulances. In December 1943, to assist the R.C.A.M.C. Training Centre, arrangements were made to give medical officers a four weeks basic training course at the Officers' Training Centre at Brockville. This course was designed to give the young medical officers the 'feel' of the Army, an *esprit de corps*, and a basic knowledge of army procedure. Only medical officers of overseas category and age took this course. It was of great assistance to A-22 as it permitted it to devote much more time to Corps training.

THE R.C.A.M.C. IN BRITAIN, 1940-1943

THE Canadian troops who proceeded to the United Kingdom during the of 1939-40 expected to join the British Expeditionary Force in France early the following summer. But fate decreed otherwise. The success of the German invasion of Denmark and Norway in April, followed by the equally successful offensive on the Continent and the total collapse of France, left the 1st Canadian Division and its ancillary units with no immediate alternative to a purely defensive role in the United Kingdom. More than three years were to pass before any significant number of Canadians left the United Kingdom for a theatre of war. A fourth was to elapse before the whole of the Canadian field army stood committed to battle.

THE FIRST WINTER OVERSEAS

The first winter was an especially difficult period for the medical service. The weather was unusually severe, and a mild form of influenza was epidemic among the civilian population. The unhardened Canadian troops, quartered for the most part in barracks that lacked the degree of heat to which they were accustomed, fell victim in large numbers both to the prevalent influenza and to various other types of upper respiratory disease. Cases of German measles were numerous, and for a short period there was the threat of a serious outbreak of cerebrospinal fever. The efforts made to maintain some warmth in the barracks by keeping doors and windows shut only served to spread infections.

The facilities of three long-established British military hospitals were available in the Aldershot area; the Cambridge Hospital for major surgery and acute medical cases; the Connaught Hospital for minor surgical and medical cases and for skin and venereal diseases; the Military Isolation Hospital for infectious diseases. A considerable number of Canadians were also hospitalized in Park Prewett Hospital an Emergency Medical Service installation near Basingstoke. Personnel of Canadian Military Headquarters received medical attention and hospital treatment at Queen Alexandra Military Hospital in London. All these hospitals were equipped and staffed to provide the highest standard of medical care. But such was the amount of sickness that the capacity of those in the Aldershot area proved insufficient to meet both Canadian and British requirements. The increased number of troops to be served, British and Canadian, would probably have created difficulties in even a normal winter; the complications of this particular one exceeded all expectations.

To supplement the existing hospital facilities and thus reduce as far as possible the number of patients receiving treatment in unit lines, the medical

service of the 1st Canadian Division opened two camp reception stations on 11 January. Through these, all Canadian sick were thenceforth channelled; minor cases were retained, while the more serious ones were transferred to hospital. As a further measure No. 4 Field Ambulance early in February opened a temporary convalescent depot at Bordon. A few days later, to provide a place of treatment for all cases of German measles, a Canadian infectious diseases hospital was established at Aldershot by personnel of No. 2 Field Hygiene Section.

The arrival of non-divisional medical units towards the middle of February eased the pressure and permitted a modest expansion of Canadian medical activity. No. 1 Convalescent Depot immediately proceeded to Bordon to take over the convalescent depot from No. 4 Field Ambulance. The staffs of the camp reception stations and the infectious diseases hospital were for the most part replaced by personnel from the two general hospitals. Field ambulance officers who had been assisting or acting as unit medical officers were similarly relieved. The hospital units also undertook to provide officers for the Canadian standing medical board that had for some time been functioning in the Aldershot area, and to attach various specialists to the Connaught and Cambridge Hospitals.

During the latter part of February the Canadian infectious diseases hospital, its name changed to Canadian Medical Centre, was directed to accept as many as possible of those with upper respiratory infections in order to lessen the overcrowding of the British hospitals. All cases of German measles, the number of which by this time was on the decline, were thereafter sent to the British Military Isolation Hospital.

FIELD MEDICAL UNITS, 1940-1942

The release of the field medical units from the task of caring for the sick gave them more time for training and an opportunity to take part in several interesting, although abortive, operations that marked the early spring and summer of 1940.

The first of these was the proposed attack on the German-held Norwegian port of Trondhjem in mid-April. Although the operation was never launched, a detachment of No. 5 Field Ambulance did go to Scotland, and, after nearly a week of waiting, suffered the disappointment of having to return to its less glamorous role of routine training in the Aldershot area.

Attention was soon diverted to the possibility of other operations. Immediately after the Germans launched their offensive on the Continent on 10 May, the first stage of the plan for the defence of the United Kingdom was put into effect. The Canadian role was that of "G.H.Q. Reserve", to support either the British divisions in East Anglia or those defending the Home Counties. Nos. 4, 5, and 9 Field Ambulances were placed under command of the 1st 2nd, and 3rd Canadian Infantry Brigades respectively. No. 2

Field Hygiene Section remained under the direct control of the A.D.M.S. Routes to suitable assembly areas were checked, training was intensified, loading and unloading of kit and stores was practised daily, and dusk and dawn patrols maintained careful watch for enemy troops descending from the skies. The attack never came and after two weeks 'guard duty' the possibility of meeting the enemy in France appeared imminent. Plans to dispatch a Canadian brigade group to assist the British Expeditionary Force were put into effect and on the early morning of 23 May the medical component of the brigade, No. 4 Field Ambulance, entrained for Dover. Before it reached its embarkation point, news was received that the operation was cancelled and No. 4 returned to Aldershot, its members just as disappointed as those of No. 5 after returning from Scotland.

Fortunately there was little time for reflection on the quirks of fate, let alone relaxation. The 1st Canadian Division and ancillary troops were in the process of being organized into a number of self-contained, mobile, battle groups for the defence of Britain. On 29 May, when this had been completed and additional equipment and transport secured, "Canadian Force" came officially into being. Nos. 4, 5, and 9 Field Ambulances formed part of their respective brigades, and No. 2 Field Hygiene Section remained, as before, under the direct command of the A.D.M.S. By 1 June all the divisional medical units were concentrated with the rest of "Canadian Force" in the general area, Northampton-Wellingborough-Kettering. The non-divisional medical units remained in the vicinity of Aldershot under the command of Canadian Military Headquarters.

In the expectation that part or all of No. 4 Casualty Clearing Station would join "Canadian Force", the medical arrangements in the Northampton area were based on the policy that all casualties should be treated in Canadian medical units, with the exception of the more serious cases and communicable diseases which should be transferred to civilian hospitals in the area. Apart from the desirability of retaining casualties under Canadian control, the main intention was to give the field medical units every opportunity to familiarize themselves with the part that they would likely have to play at some future date. In fact, each field ambulance functioned as a field hospital and, since No. 4 Casualty Clearing Station did not join the force, performed most of the major surgery.

Medical arrangements at Northampton hardly received a fair test for on 6 June "Canadian Force" began to move back to Aldershot. On 8 June all medical units were inspected by Their Majesties the King and Queen during a royal visit to the 1st Canadian Division that appropriately marked its impending departure as part of a second British Expeditionary Force which was hastily being gathered together in a last desperate effort to save France.

The only R.C.A.M.C. unit to reach France on this occasion was No. 4 Field Ambulance. It crossed the Channel with the 1st Infantry Brigade Group between 12-14 June. The unit landed at Brest and was well inland on

its way to an assembly area in the vicinity of Le Mans when the operation was cancelled and the movement reversed. The other medical units, Nos. 5 and 9 Field Ambulances and No. 2 Field Hygiene Section, had hardly begun to move when the cancellation order was received, which was in a way fortunate. Their safe return to Aldershot within the space of a few days was a welcome contrast to the misfortunes of No. 4 Field Ambulance. The latter had to destroy all its vehicles and most of its equipment in France, returning to Aldershot during 18-19 June complete in personnel but with only such equipment as it had been possible to carry by hand.

Following the fall of France, "Canadian Force" was reconstituted as a self-contained formation on 20 June. Three days later it began to move into the Oxford area. No. 4 Casualty Clearing Station joined it on 26 June. Here the medical arrangements differed considerably from those previously in effect, due mainly to a revised conception of the required distribution of medical resources within a division organized as a number of battle groups. An R.C.A.M.C. group was formed with the object of centralizing control of the medical service to the maximum extent consistent with providing for the minimum daily requirements of each brigade group. Companies were detached from field ambulances, each opening an advanced dressing station to serve its own brigade group, while the headquarters company of No. 9 Field Ambulance opened a main dressing station for the whole force. No. 5 Field Ambulance, less its detached company, undertook the duties of a motor ambulance convoy. Casualties were evacuated in the normal manner. These medical arrangements remained without fundamental change when "Canadian Force" moved southward into Surrey. Here on 21 July, the 7th Corps, composed of the 1st Canadian Division, the 1st British Armoured Division, and the greater part of the 2nd New Zealand Division, came into being.

The 7th Corps remained in existence until Christmas Day 1940, when it was replaced by a Canadian Corps consisting of the 1st and 2nd Divisions. Medical units of the 2nd Division, Nos. 10, 11, and 19 Field Ambulances and No. 13 Field Hygiene Section, formed, with the medical units of the 1st Division, the divisional medical units. No. 4 Casualty Clearing Station, and No. 8 Field Ambulance and No. 5 Field Hygiene Section, plus No. 6 British Motor Ambulance Convoy were allotted to Corps Troops.

The winter of 1940-41 was largely uneventful from a military standpoint but was a busy one for the medical service. The weather, as during the previous winter, was most unkind, and sickness was widespread. At one period during the winter Nos. 5 and 15 General Hospitals, which had opened during the summer at Taplow and Bramshott respectively, were too full to accept any more patients. No. 4 Casualty Clearing Station at this time had more patients than could be accommodated satisfactorily. The opening of No. 1 General Hospital at Marston Green, near Birmingham, in January 1940 was sufficient to relieve the situation, and fortunately the winter passed without any serious epidemics.

Early spring saw the Canadian Corps take part in several large exercises which gave it excellent training in the counter-attack role which it might be called upon to perform at any time since the danger of invasion was ever present. Throughout the spring and summer of 1941 anti-invasion training remained the chief preoccupation. Numerous exercises carried out by all formations during June, July, and August, culminated at the end of September, in the great army manoeuvres that will live long in the memory of participants as Exercise "Bumper".

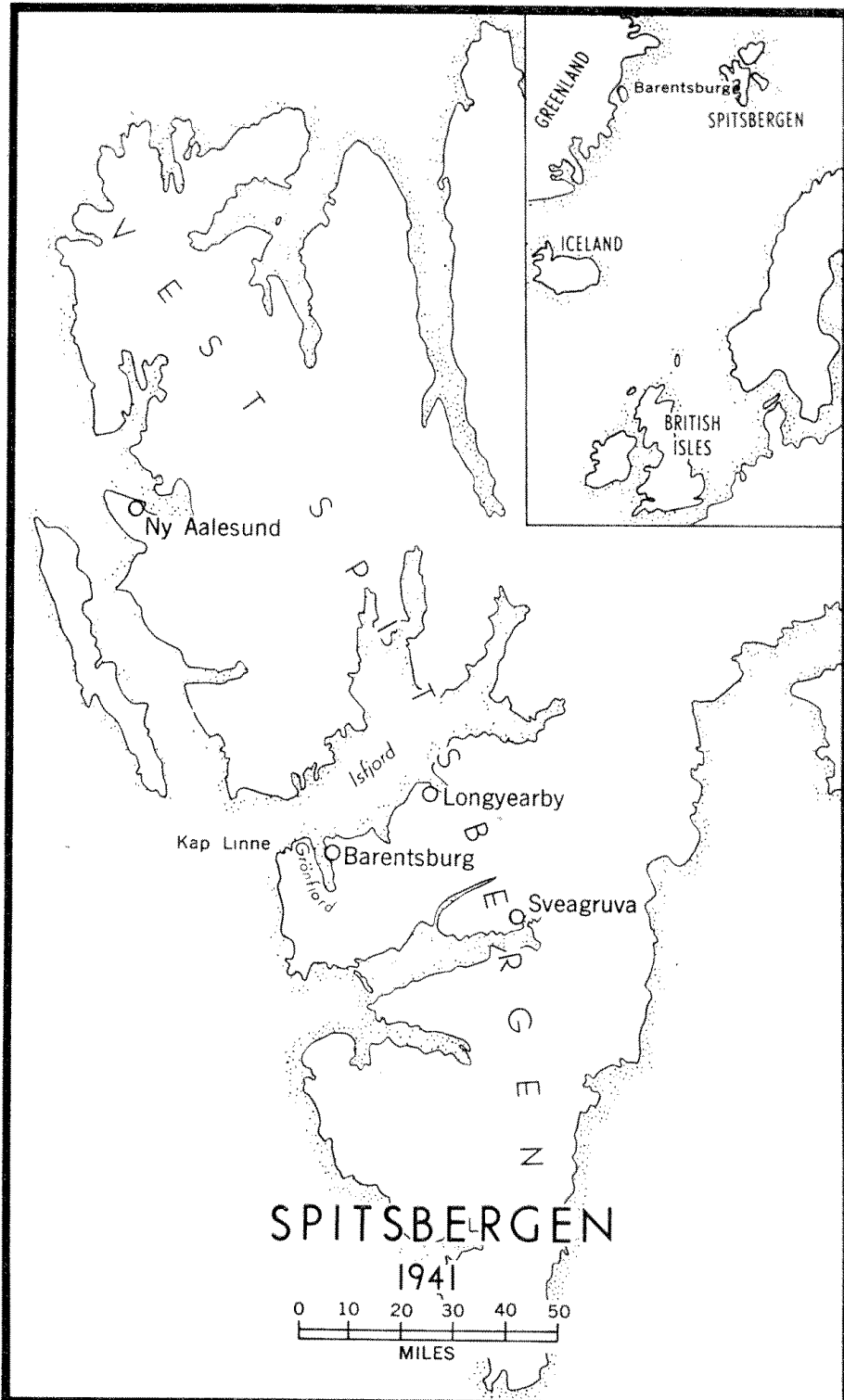
During the summer of 1941 there were several changes in the medical services of the Canadian Corps. No. 8 Field Ambulance replaced No. 18 in the 2nd Division, the latter returning to Corps Troops. No. 5 Casualty Clearing Station joined the Corps on 19 July, while later in the year the British motor ambulance convoy was replaced by No. 1 Canadian Motor Ambulance Convoy.

The outstanding event of 1941 was, no doubt, the expedition to Spitsbergen. It was originally intended to send a large force to occupy the archipelago so that a naval anchorage and refuelling base might be established there. No sooner had the necessary force, with its medical component, assembled at a combined training centre in Scotland than the original plan was cancelled in favour of a less ambitious one - a temporary landing on Spitsbergen for the purpose of removing or destroying anything of value, and of evacuating the inhabitants, the Russians to their homeland, the Norwegians to the United Kingdom. The medical component under the new arrangement was to consist of three officers and 23 other ranks, all R.C.A.M.C. personnel.

The force left Scotland on 14 August on board the *Empress of Canada* and after an uneventful voyage landed on Spitsbergen, after aerial reconnaissance revealed that no opposition was to be expected. Following the landing the medical component was divided into several small detachments, one accompanying an escort destroyer to the Norwegian settlement of Longyearby, others accompanying demolition parties to more isolated settlements. The rest of the party remained on board to provide medical care for the Russians during the evacuation to their homeland.

Ashore it was discovered that there were two small well-equipped hospitals. One of these, owned by the Russians proved of little value as its electrical supply and all moveable equipment had been destroyed or removed by the Russians prior to their departure. The other, operated by the Norwegians, had all essential services functioning and it was to this hospital that the one serious casualty, an accidental penetrating chest wound, was taken. Later an appendectomy was successfully performed here.

Meanwhile, on the night 26/27 August, the *Empress* had sailed for Archangel with nearly 2000 Russians, and by the evening of 1 September had returned bearing some 200 Free French officers and men who had been interned in Russia. For the medical party on board the *Empress* the round



Historical Section, G.S.

trip had been notable chiefly for the problem of hygiene and sanitation created by the Russians and the unhappy result among the Free French of the sudden change of diet.

Final evacuation arrangements were completed by the 3rd, the two casualties in the Norwegian hospital having been transferred to the *Empress* the previous day. Late on the night of the 3rd the entire force, increased by some 1000 Norwegians, in addition to the Free French troops, left Spitsbergen. The return voyage presented no difficulties to the medical detachment and only two cases were admitted to ship's hospital.

Some difficulty was encountered at Gourock when the stretcher cases were ordered to be disembarked by tender with the other troops. The officer commanding the medical detachment objected vigorously and in the end the casualties were allowed to remain on board until the ship docked at Glasgow. Here they were disembarked and transferred to a hospital coach and evacuated to Oxted, thence to a small 'hospital' maintained by No. 5 Field Ambulance.

Unopposed though it was, the expedition to Spitsbergen almost cost several lives. Altogether, slightly more than 700 military and civilian patients were treated for various ailments, the majority aboard the *Empress* in the ship's hospital. That there were no fatalities among these was due in the final analysis to the fine co-operation of all concerned with their care. As the commanding officer stressed in concluding his report on the medical aspects of the operation, thanks were particularly due to the Norwegian medical staff at Longyearby and to the various British medical officers aboard His Majesty's ships.

Shortly after the return of the troops engaged in the Spitsbergen expedition, the Canadian role in the defence of the United Kingdom was altered. Thus far kept in reserve as a mobile counter attack force, the Canadian Corps in the autumn of 1941 was made responsible for the direct defence of the greater part of the Sussex coast. The move into Sussex began on 15 October, when the 2nd Canadian Division relieved the 55th British Division. Headquarters, Canadian Corps, officially assumed its new responsibilities on 17 November. By the end of the month the 1st Canadian Division had relieved the 38th British in the western sector of the front, and the 3rd Canadian had replaced the 47th British in corps reserve. The 1st Canadian Army Tank Brigade arrived in Sussex about the middle of December.

The addition of two new formations to the order of battle automatically increased the number of medical units serving with the Canadian Corps. In the 3rd Division were Nos. 14, 22, and 23 Field Ambulances and No. 7 Field Hygiene Section. In the 1st Army Tank Brigade the R.C.A.M.C. were represented by No. 2 Light Field Ambulance. All of these units had arrived in the United Kingdom during the summer and early autumn of 1941. After a period of training and equipping under the control of Canadian Military

Headquarters, they came under the full operational and administrative control of the Canadian Corps on 15 November, along with the formations of which they formed an integral part. At the same time, No. 1 Advanced Depot Medical Stores joined the Corps. Despite its designation, this was in fact a new unit. It was formed at Aldershot during September to replace the one which had arrived in the United Kingdom in February 1940, but which subsequently had been converted into No. 2 Base Depot Medical Stores.

When the Canadian Corps moved into Sussex, the R.C.A.M.C. order of battle thus included not only the medical units of the 1st 2nd, and 3rd Divisions, and the 1st Army Tank Brigade, but also the following Corps Troops medical units : No. 18 Field Ambulance, No. 5 Field Hygiene Section, Nos. 4 and 5 Casualty Clearing Stations, No. 1 Motor Ambulance Convoy, and No. 1 Advanced Depot Medical Stores.

Broadly speaking, the medical service of the Canadian Corps during the winter of 1941-42 functioned according to the following pattern. At each regimental aid post there were from five to ten beds available for those not expected to be ill for more than 24 hours. Each field ambulance maintained accommodation for 25 to 75 patients, depending on the amount of space available. In each division, two field ambulances normally looked after the sick while the third participated in combined training with other arms. Changes of role were frequent, so as to give varied experience to all units. Field hygiene sections operated schools of instruction for regimental sanitary personnel and were responsible for the control of infectious diseases. Nos. 4 and 5 Casualty Clearing Stations, installed in large country houses supplemented by huts, had accommodation for 130 and 160 patients respectively. Anyone expected to be ill for more than three or four days was transferred from a field ambulance to one or other of these.

Few important additions were made during the winter to the number of medical units actually serving with the Canadian Corps. On 26 March all mobile bath units, which in January 1941 had been placed under the control of the Royal Canadian Ordnance Corps, were transferred back to the R.C.A.M.C. The 5th Armoured Division, including Nos. 7, 12, and 24 Light Field Ambulances and No. 11 Light Field Hygiene Section, which had reached the United Kingdom in the late autumn of 1941, remained throughout the winter under command of Canadian Military Headquarters. No. 6 Casualty Clearing Station, arriving overseas on 29 March 1942, was employed for some months as a static hospital. A mobile bacteriological laboratory and a mobile hygiene laboratory mobilized in the United Kingdom early in 1942 did not join the field force for some time.

On 6 April 1942 Headquarters, First Canadian Army, was formed in accordance with the decision taken by the Canadian Government in January to establish overseas a Canadian Army of two corps, consisting of three infantry and two armoured divisions, two army tank brigades, and the necessary ancillary units. Simultaneously, the Canadian Corps became the

1st Canadian Corps. These events had no immediate effect on the organization, distribution, or command of field medical units. Those that were not an integral part of the First Canadian Army, or were not considered trained and fit to take their place in the field, remained under the command of Canadian Military Headquarters. At first, no medical element was provided within Headquarters, First Canadian Army.

The 2nd Canadian Corps, first scheduled to be formed in July 1942, did not actually make its appearance until January 1943. During August, Army Headquarters assumed command of the 5th Armoured Division complete with its medical component. The 4th Armoured Division, with Nos. 12, 15, and 16 Light Field Ambulances and No. 12 Light Field Hygiene Section, reached the United Kingdom in the early autumn. By the end of November, this formation too was under the direct command of the First Canadian Army. At about the same time, No. 2 Motor Ambulance Convoy, which had arrived overseas in October, and No. 6 Casualty Clearing Station appeared in the field as Army Troops.

By the end of the year there were 41 field medical units, exclusive of hospitals, serving in the United Kingdom, as illustrated at Appendix "C". Meanwhile, plans for a reorganization of the field medical service had matured. They took effect in January 1943 and thus inaugurated a new period in the history of the R.C.A.M.C.

REORGANIZATION OF THE FIELD MEDICAL SERVICE

Considerable attention was devoted to reorganization in both the British and the Canadian medical services during 1940 and 1941. But the only important modification introduced during these years was a minor internal reorganization of the field ambulance, designed to make this unit more flexible in the sense of being able easily to provide detachments for brigade and battalion groups.

At the end of December 1941 the report of a British committee especially appointed to study the problem, under the chairmanship of Brigadier W. C. Hartgill, was submitted to the War Office. The opening paragraph stated:

It is obvious from a study of the Spanish Civil War and from experience gained in the various campaigns of the present war, that a reorganization of the medical services in the corps and division is long overdue.

The chief defects in the existing system were listed as follows:

- (i) Field medical units are cumbersome, insufficiently mobile and not readily adaptable to changing tactical situations.
- (ii) Field ambulances do not possess adequate means of communication, either with the formations they serve, or with the officers who administer them.
- (iii) Casualties are not distributed directly to the appropriate units, but pass through a channel of evacuation, which causes congestion at the forward medical units. Insufficient transport leads to delay in the distribution of casualties to selected centres.
- (iv) Casualties are not afforded the advantages which modern surgical technique can provide. Surgeons, their assistants and equipment are located too far to the rear of divisions and corps.

To overcome these defects, the reorganization of the field medical service in advance of railhead was considered to be "imperative and urgent".*

The Hartgill Committee's detailed proposals involved far-reaching changes in existing units and the creation of several new ones; they were for the most part adopted by the British. On 6 July 1942 the War Office announced that it had been decided to reorganize the field ambulance, the casualty clearing station, and the motor ambulance convoy, to introduce two new units, the field dressing station and the field surgical unit, and to site a 200-bed general hospital in the vicinity of railhead as an intermediate installation between casualty clearing station and base hospital. The field transfusion unit was also to form a part of the new organization.

The Hartgill Scheme

The new British organization was most revolutionary in the division. The field ambulance, less its main dressing station component, was reorganized as a fully mobile collecting and evacuating unit, comprising a headquarters and two bearer companies each of three sections. The scale of provision was on the basis of one per infantry brigade. The light field ambulance, already organized as a headquarters and four sections because of its mobile role in support of armour, was left unchanged apart from an increase in ambulance cars and drivers. As before, one was provided for each armoured brigade. Immediately above these units, the divisional field dressing station was introduced, two per infantry and one per armoured division.

The corps field ambulance was abolished. In its place was the corps field dressing station on the scale of one per corps and one per division within the corps. The casualty clearing station was reduced in size and provided on the basis of two per corps and one per army. It had certain domestic vehicles, but was still not mobile; 24 three-ton lorries had to be provided from formation transport resources in order to move it. The motor ambulance convoy was made a unit of the Royal Army Service Corps, but continued to be under the operational control of the medical service. One was provided for each corps, and for higher formations as required.

Field surgical and field transfusion units were classed, some as Army, some as G.H.Q. Troops. The basic scale of provision was, for the former, two per infantry or armoured division, for the latter one per corps and one per division. The field surgical unit, when attached to a field dressing station, formed the surgical component of an advanced surgical centre. The field transfusion unit, designed to provide an expert transfusion service wherever required, might be attached to a casualty clearing station, a field dressing station, or even a field ambulance.

* 6/Reorg. Med /1: Report by the committee appointed to make recommendations for the reorganization of the medical services in the field

Also available among G.H.Q. Troops was the 200-bed general hospital, on the scale of one per corps. A fully equipped hospital, it could be moved, but was not mobile. It was capable of crisis expansion on stretchers and held a 'pool' of nursing sisters over and above its own quota.

The field hygiene section was given a new establishment applicable to all formations, the scale of provision being one per infantry or armoured division and one per corps. The light field hygiene section was abolished. No change was made in the establishments or scale of provision of such units as the advanced depot medical stores, the base depot medical stores, the convalescent depot, the general hospital (600 or 1200 beds), or the various mobile laboratories.

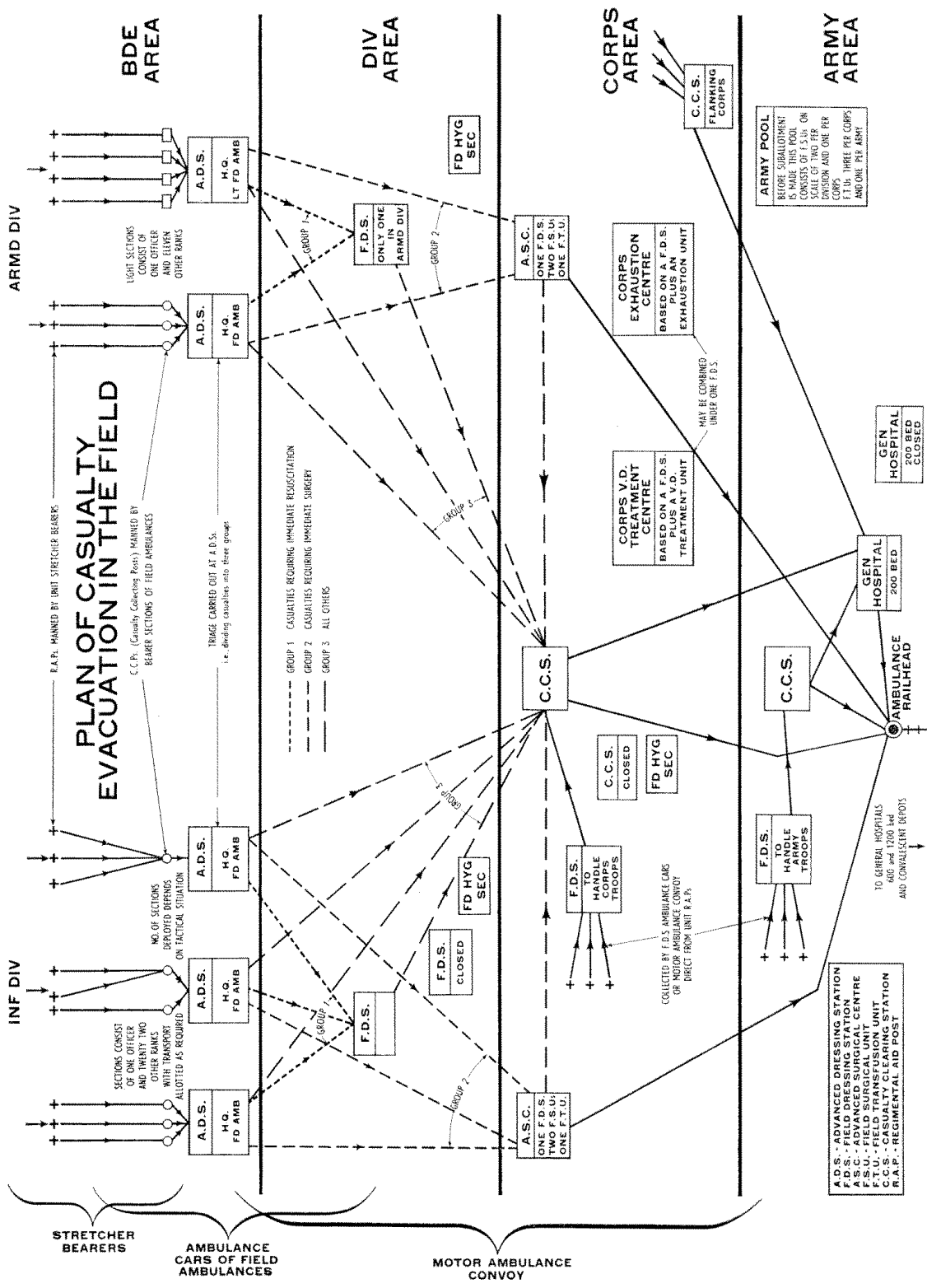
The system of casualty evacuation for which the new organization was designed is illustrated in the accompanying diagrammatic sketch.

The field ambulances, one designed to support armour, the other infantry, had identical functions. The headquarters formed an advanced dressing station, and the sections, to the number required for any particular operation, established contact with regimental aid posts and evacuated casualties rearward through casualty collecting posts to the advanced dressing station. The chief task of the latter was triage, that is, rapid diagnosis, essential first aid, sorting and labelling of cases in order of priority for further evacuation, and documentation.

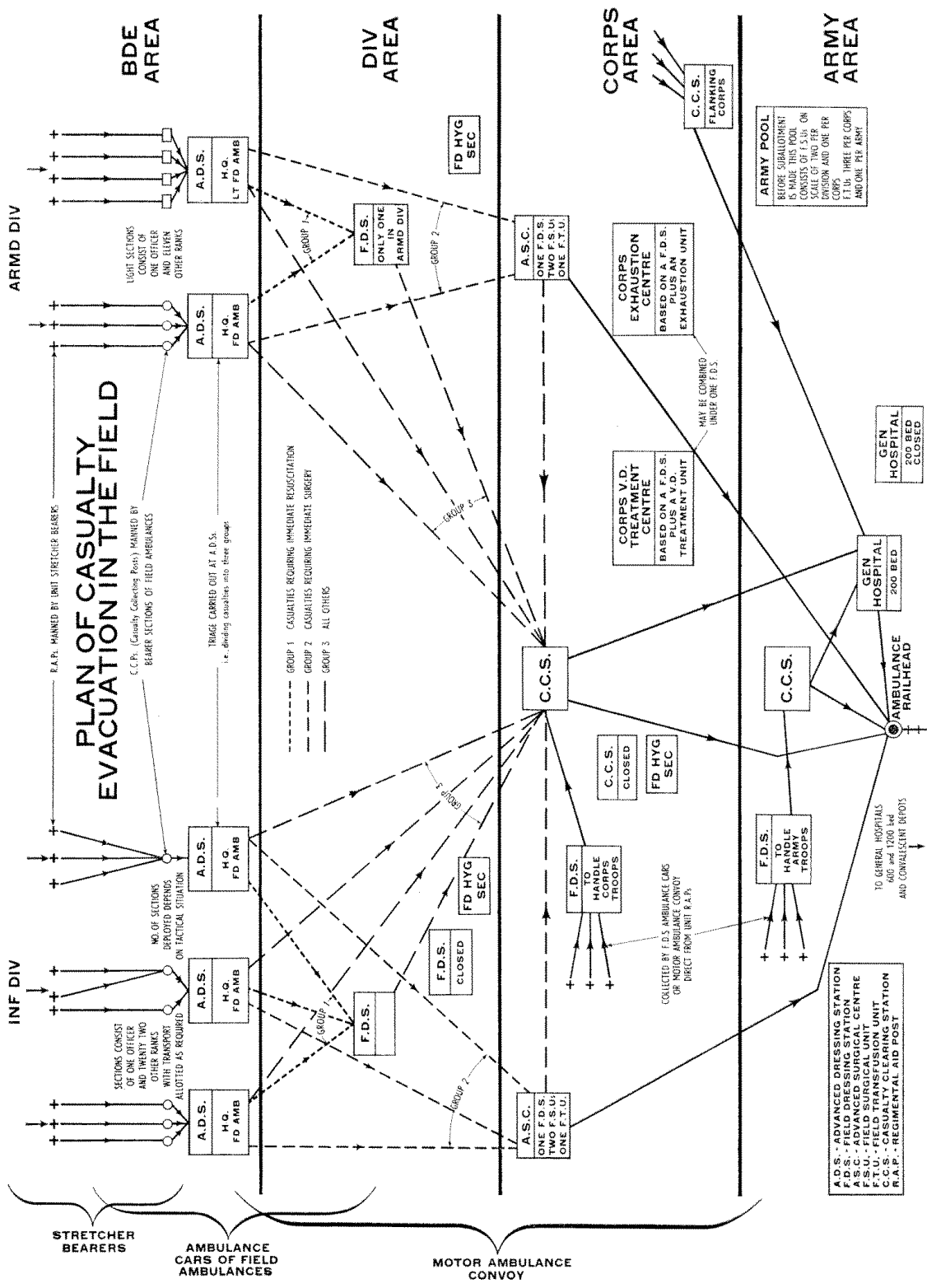
As part of the triage process, casualties were grouped in three main categories. Those in Group I, cases of severe shock requiring immediate resuscitation, could be dealt with at the advanced dressing station but were normally evacuated in field ambulance transport to a divisional field dressing station. Group II cases, severe wounds requiring immediate surgical attention, were evacuated to a corps field dressing station functioning, in conjunction with one or more field surgical units, as an advanced surgical centre. Group III encompassed all other cases and were evacuated directly to a casualty clearing station. Transport for casualties in Groups II or III was provided by the motor ambulance convoy.

The primary function of the divisional field dressing station was thus the resuscitation of Group I casualties, and for this reason a field transfusion unit was normally attached. Its secondary role was that of an advanced dressing station for troops in the vicinity. Only in exceptional circumstances was it intended to form the basis of an advanced surgical centre, since it would thereby become immobilized for several days with post-operative cases.

This latter was the chief role assigned to the corps field dressing station. When so employed it was sited well forward in the corps area, even in a divisional area, in order to make surgical facilities available as near to the fighting zone as possible. To provide a corps rest station for exhaustion cases, a place of treatment for gas casualties, or any other special treatment centre considered necessary by the D.D.M.S. was its subsidiary function.



PLAN OF CASUALTY EVACUATION IN THE FIELD



The casualty clearing station, apart from providing surgical facilities for Group III casualties, held all sick from division and corps troops until evacuated. In non-operational periods minor sick were retained until cured or convalescent.

Additional accommodation for Group III casualties and sick was provided by the 200-bed general hospital, though its chief function was to act as a temporary holding hospital, in the vicinity of ambulance railhead, for wounded and sick en route from a casualty clearing station to a 600- or 1200-bed hospital on the line of communications or in the base area. From the 'pool' held by this unit it was intended that nursing sisters would be called forward for duty at advanced surgical centres, or elsewhere in the forward area, whenever the tactical situation permitted.

Canadian Counter-Proposals

Canadian reaction to the new British medical organization was generally unfavourable, and extremely mixed. By the end of 1942 a distinct cleavage had developed between the chief proponents of the several counter-proposals put forward and nothing had been settled.

Towards the end of July the D.D.M.S., 1st Canadian Corps, Brigadier Linton, and several A.Ds.M.S. attended a study-week organized by a neighbouring British corps to discuss the details and implications of the new organization. As a result, Brigadier Linton reached the conclusion that on balance it would be wise to adopt the British organization, "suitably modified". The chief modifications suggested were: first, that two nursing sisters replace the two male operating room assistants carried on the establishment of the field surgical unit; secondly, that medical officers be employed as stretcher bearer officers and as registrars of casualty clearing stations instead of non-medical officers as proposed by the Hartgill Committee; thirdly, that the motor ambulance convoy remain a medical unit; lastly, that a smaller field ambulance evolved by the 1st Canadian Division be substituted for the new British one and made common to both infantry and armoured divisions.

On 3 August the D.M.S., Canadian Military Headquarters, Brigadier Luton, held a conference of senior Canadian medical officers to consider the problem. At this meeting, from which Brigadier Linton was absent on other duties, it was decided not to adopt the new British organization, but instead, a Canadian one that had recently been "partially drawn up and used in the 1st Canadian Division . . ., tested under battle conditions and proved to be satisfactory". A recommendation to this effect was forwarded to Lieutenant-General McNaughton, the G.O.C.-in-C. First Canadian Army, the following day.

Faced with a choice between two apparently feasible medical organizations, General McNaughton decided to put the Canadian scheme to the

test before reaching a final decision. On 17 August, accordingly, Brigadier Luton was informed that when provisional war establishments for the various units were available arrangements would be made for a Canadian division to carry out comprehensive field trials.

Designed to achieve greater flexibility and mobility, facilities for surgery in the forward area, improved communications, and more transport for casualties, the proposed Canadian organization was similar in form to the new British one. But on several basic points there were important differences. First, the Canadian scheme envisaged but one type of field ambulance for both armoured and infantry divisions, one comprising a headquarters and four bearer sections. Secondly, in the division there was no increase in personnel over the old organization. This was the chief feature argued in its favour. Although field ambulances were provided on the scale of four per infantry division and three per armoured division, the establishment of each was much smaller than in either the old or the new British organization; similarly, the Canadian field dressing station was smaller than its British counterpart. Thirdly, the changes introduced beyond the division were limited mainly to the provision of field surgical units and field transfusion units, whose inclusion in the Canadian medical service had been under consideration for some time. There was to be only one corps field dressing station. No change was made in either the establishment or the command of the motor ambulance convoy. The casualty clearing station was modified only by taking away its light section. The idea of placing a 200-bed general hospital in the vicinity of railhead was rejected. Lastly the mobile bath unit was amalgamated with the field hygiene section instead of being made a unit of the Ordnance Corps after the new British pattern.

By 31 August provisional establishments for the component units of the tentative Canadian medical organization had been prepared by a committee that included the D.M.S., the D.D.M.S., and all A.Ds.M.S. On 13 September the 3rd Division was ordered to so re-distribute the personnel of its existing medical units to form four field ambulances, two field dressing stations, and one field hygiene and mobile bath unit on the new establishment preparatory to carrying out a five day trial exercise in the course of preparation. Between 2-6 November the trial was carried out, as Exercise "Sawbones".

The 1st Division, which had made all the experiments, was originally selected to carry out this demonstration, but was unable to do so because of other commitments. The 3rd Division was relatively unfamiliar with the new organization, and due to the intervention of another exercise it was unable to carry out adequate preparatory study by means of cloth-model exercises and tactical exercises without troops. Early in September the D.D.M.S. had officially dissociated himself "from any appearance of acquiescence" in the Canadian plan, which he described as "so inept that it is not capable of adjustment to meet our needs". Its two basic faults, he argued, were the assumptions, first that medical arrangements within the division could be

recast without destroying the balance and efficiency of the medical service as a whole, and secondly, that greater mobility and earlier surgery, the primary objects of reorganization, could be achieved without any increase in personnel.

Even considering these several adverse factors, Exercise "Sawbones" was not encouraging in its results. All extant reports, though differing in detail and emphasis, reached roughly the same conclusion: the Canadian scheme as it stood was not workable. Little criticism was levelled at corps units such as the field surgical unit and the corps field dressing station. Within the division, the increased facilities for collecting casualties in the forward area and the advancement of triage to the advanced dressing station, through abolishing the main dressing station component of the field ambulance, were considered to be sound innovations, inasmuch as they accelerated evacuation and minimized the rehandling of patients. Against these advantages, it was considered that the trial organization was "extravagant in overheads, involving four field ambulance headquarters per division", and that "the lavish application of manpower to evacuate from the regimental aid post" precluded "the provision within corps resources of adequate field dressing station facilities and of a corps troops field ambulance", a defect envisaged as having "the effect of so reducing the resources in the hands of the D.D.M.S. as to seriously impair (the) flexibility of the entire system".* The exercise also revealed that the motor ambulance convoy was placed "under a severe added strain being required not only to reach several miles further forward in its collection but to pick up from a possible six locations per division forward of the casualty clearing station . . . , contrasted to the three main dressing stations per division and one main dressing station per corps" under the existing organization. Finally, the Canadian type of field dressing station was found to be too limited in personnel and equipment to perform adequately its function as a resuscitation centre.

It is open to debate whether Exercise "Sawbones" was a sufficient or even adequate test of the Canadian, let alone of the Hartgill proposals. The net result was a recommendation by Brigadier Luton, "unanimously agreed upon at a meeting . . . attended by the D.D.M.S., 1st Canadian Corps, and all A.Ds.M.S." that in the Canadian Army the old medical organization for both infantry and armoured divisions be retained, and that changes be confined to the introduction of field dressing stations, field surgical units, and field transfusion units in corps and army formations; specifically:

1. That the present Canadian divisional establishment for both armoured and infantry be retained
2. That Corps medical units consist of:
6 Field Dressing Stations
5 C.C.Ss.

* H.S. 220C1.009(D56): G.I.S., 1 Cdn Corps to H.Q., First Canadian Army (attention G.O.C.-in-C), 6 December 1942. Other reports are to be found in W.D., D.D.M.S., 1 Cdn Corps, November 1942, Appx. 4, and in 6/Reorg Med /1.

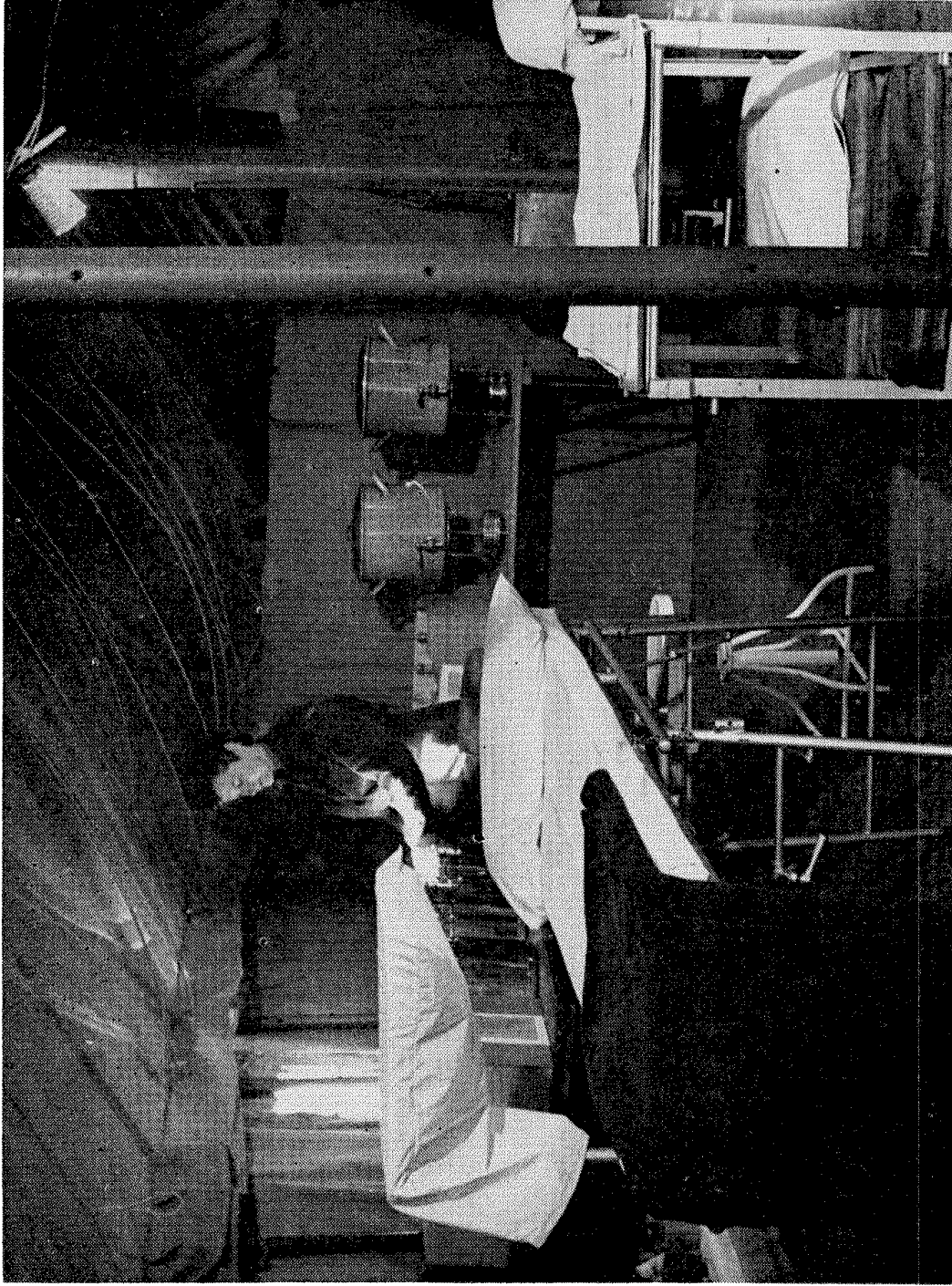
- 2 M.A.Cs.
- 2 Fd Ambulances
- 2 Fd Hygiene Sections and Mobile Bath Units
- 2 Advanced Depot Medical Stores
- 3. That Army Troops provide for two corps:
 - 10 Field Surgical Units
 - 5 Field Transfusion Units
 - 1 600-bed General Hospital
- 4. Provision for Army Troops must be in addition to the above.

The principal supporting argument was that to adopt the British medical organization was impossible in view of the Canadian manpower situation. This latest proposal, it was claimed, would effect a saving of 45 officers and 814 other ranks. But a careful comparison of war establishments suggests that Brigadier Luton's compromise organization would in fact have saved hardly more than 100 personnel.

Nor does the stated unanimity of opinion on this recommendation appear really to have existed. Another and far different proposal had been evolved almost simultaneously within the 1st Canadian Corps, presumably by Brigadier Linton. As put forward on 6 December over the signature of the G.O.C., Lieutenant-General H.D.G. Crerar, this had three main features. First, the existing six companies of the three field ambulances per division would be regrouped into two field ambulances of three companies each. Secondly, in the headquarters of each field ambulance the command would be separated from the main dressing station element. The latter would be used as a divisional field dressing station, though remaining part of the field ambulance. The headquarters of the third field ambulance would be turned into a corps field dressing station, those thus acquired being pooled as a reserve under the D.D.M.S. Thirdly, an increase in mobility and carrying capacity would be obtained by introducing into each field ambulance company six cars 5-cwt 4 x 4 (jeeps), amounting to 36 per division. A minor reorganization on these lines, it was contended, would ensure the necessary economy of manpower and would reduce to a minimum the time required for retraining units and personnel.

The Solution

Lieutenant-General Crerar expressed the opinion that the differences between the medical organization he recommended and the British would create no great difficulty in a joint force, if the Canadian component were not less than a division. In the final analysis this was the crux of the whole organizational problem, no less for the R.C.A.M.C. than for the other branches of the service. So long as it was intended to employ the First Canadian Army as a distinctly separate entity, divergence from British organization was not important provided that Canadian requirements were satisfied. From the moment that the employment of a Canadian division or even a



A FIELD SURGICAL UNIT

The introduction of this mobile unit into the R.C.A.M.C. early in 1943 marked a new phase in the treatment of casualties. The field surgical unit was designed primarily to provide facilities for surgery in the forward area and thereby increase the chances of survival and recovery for many casualties. Provided with modern equipment which enabled it to undertake the most urgent surgical cases, it was highly mobile and could be set up in a new location within 20 minutes of arrival and be ready to receive patients shortly afterwards.

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Canadian corps as part of a higher British formation was considered, any dissimilarity in organization became at least a potential threat to effective co-operation within the combined force.

By the end of December 1942 it had become apparent that there was every possibility of one or more divisions being detached from the main Canadian force to serve with a British army. During that same month the manpower situation was clarified considerably by a British agreement to supply a proportion of the Army, G.H.Q. and L. of C. Troops required for the support of the First Canadian Army in the field. The net result of these concurrent developments was a decision to bring Canadian organization into complete conformity with that of the British. By so doing it was hoped both to facilitate Anglo-Canadian co-operation and to effect an overall economy in Canadian manpower.

This decision promptly reduced the controversy over the proper medical organization for the First Canadian Army to a matter of purely academic interest. The British scheme was adopted in toto with effect from 11 January 1943. Although several senior Canadian medical officers recorded in their war diaries a feeling of frustration and embitterment over this turn of events, the dictates of higher policy were accepted in a philosophical spirit. There was evident a general resolve to make the new organization work to the best possible advantage.

Reorganization Completed

In the 1st, 2nd, and 3rd Infantry Divisions of the 1st Canadian Corps, an internal reorganization of the existing field ambulances and field hygiene sections and the creation of two field dressing stations per division satisfied the new requirements of the medical services. The problem was slightly different in the 4th and 5th Armoured Divisions, grouped in the 2nd Canadian Corps when it finally came into being on 15 January 1943. In each, out of the existing three light field ambulances and one light field hygiene section, there had now to be formed one field ambulance, one light field ambulance, one field dressing station, and one field hygiene section. But since the total number of units was the same, the problem was resolved by the simple expedient of conversion. From all five divisions, mobile bath units were withdrawn, amalgamated with mobile laundry units, and transferred to Corps Troops as units of the Royal Canadian Ordnance Corps.

These measures, constituting the full reorganization required in the divisional medical services, were instituted immediately the decision to adopt British organization was promulgated. On the higher levels, the necessary changes were carried out more slowly, and for the time being were limited to the following: an internal reorganization of existing field hygiene sections and casualty clearing stations; conversion of corps field ambulances into field dressing stations; and transfer of the two motor ambulance convoys to

the Royal Canadian Army Service Corps. Provision of the full complement of medical units required over and above those of the division, including such new ones as field surgical and field transfusion units, was a gradual process dependent on a programme that was introduced in February. Although the formations that proceeded to Sicily and Italy during the summer and autumn of 1943 were ready to function according to the new scheme of things, it was very close to the date selected for the invasion of Normandy before the process of medical reorganization was completed in what was left of the First Canadian Army in the United Kingdom.

By 6 September 1943 the number of medical units allotted to field formations overseas had increased to 61, including the required proportion of general hospitals. On 15 May 1944, as illustrated at Appendix "D", the total stood at 89, again excluding units under the control of Canadian Military Headquarters. Many of these additions were provided from Canada, but a number were formed in the United Kingdom from available reinforcements or from personnel surplus to the new establishments of existing units.

Several important changes in R.C.A.M.C. command took place during the early part of 1943 in the course of completing the framework of the First Canadian Army. Brigadier C. P. Fenwick was the first D.D.M.S., 2nd Canadian Corps. His place as A.D.M.S., 2nd Canadian Infantry Division, was taken by Colonel L. M. Stuart. On 7 April 1943 Brigadier Linton vacated the appointment of D.D.M.S., 1st Canadian Corps, and shortly thereafter returned to Canada to join the staff of the D.G.M.S. He was succeeded by Brigadier E. A. McCusker, whose place as A.D.M.S., 1st Canadian Infantry Division, was filled by Colonel C. H. Playfair. Finally, on 26 May Brigadier Fenwick became D.D.M.S., First Canadian Army, the first occasion on which this appointment was filled. Brigadier C. A. Rae succeeded him as D.D.M.S., 2nd Canadian Corps.

THE DIRECTORATE OF MEDICAL SERVICES, CANADIAN MILITARY HEADQUARTERS

The activities of the R.C.A.M.C. in the United Kingdom were co-ordinated and supervised, when they were not actually controlled, by the medical staff at Canadian Military Headquarters. In the beginning this consisted solely of one officer, Colonel R. M. Luton, and one warrant officer assistant. At the conclusion of hostilities in Europe Major-General Luton headed a Directorate of Medical Services fully comparable to that co-existing at National Defence Headquarters in Ottawa. All medical questions affecting the Canadian Army Overseas came directly or indirectly within its purview. In a broader sphere, it served as a point of contact between the Canadian Medical Service and those of the United Kingdom, the United States, and other allied countries.

After a period of improvisation, the Privy Council finally gave approval on 7 May 1941 for a Directorate of Medical Services of five army medical departments, with a staff of eight officers and 19 other ranks. Consultants in medicine, surgery, and neurology were tentatively added on 23 July 1941, as well as the Deputy Matron-in-Chief. The missions were made on a fuller establishment to cover the growing needs of the R.C.A.M.C. overseas, and after four months discussion, National Defence Headquarters authorized the new establishment with effect from 15 July 1941.

The important changes thus introduced were the addition of a Consultants Department, the appointment of a D.D.M.S. free from departmental duties, the creation of a Medical Inspection Room staff as a recognized subdivision of the Directorate, and the provision of an A.D.M.S. for troops under the direct command of Canadian Military Headquarters. The position of D.D.M.S., whose functions were currently being performed by the officer in charge of A.M.D. 1, was not to be filled until 1 January 1942. The title of the Deputy Matron-in-Chief provisionally appointed in July was changed to that of Principal Matron. The total authorized strength was set at 22 officers and 43 other ranks.

Apart from the appointment in April of a physiologist to deal with the medical aspects of chemical warfare, it was 10 August 1942 before there was another organizational development of significance. On that date an establishment that totalled 38 officers and 81 other ranks, reflecting anticipated requirements to the end of the year, was submitted for approval. The notable changes proposed were a medical historian, a consultant in radiology, seven specialists in neuropsychiatry for attachment to field formations, and a number of non-medical officers for administrative duties.

This latest estimate of the staff requirements of the Directorate was subjected to close scrutiny and a certain amount of criticism. In the process the number of officers was increased to 41, and that of other ranks was reduced to 56. As thus revised, it finally received official sanction in March 1943 as part of a new establishment for the Adjutant-General's Branch as a whole.

The only noteworthy occurrence during the balance of 1943 was the disappearance of an A.D.M.S. for troops under command of Canadian Military Headquarters. On 7 February 1944 the D.M.S. became a Major-General. In March the physiologist and the medical historian previously authorized as part of his personal staff were deleted from the establishment. In their places three majors were appointed to the staff of A.M.D. 5 to deal respectively with medical history, medical intelligence, and the medical aspects of chemical warfare. At the same time, a Matron was added to the staff of A.M.D. 4 to assist in the administration of the nursing service. In April an Inspector of Hospitals was appointed.

By the middle of June 1944 the authorized officer strength of the Directorate had reached 45, the peak figure. Thereafter, generally speaking, the

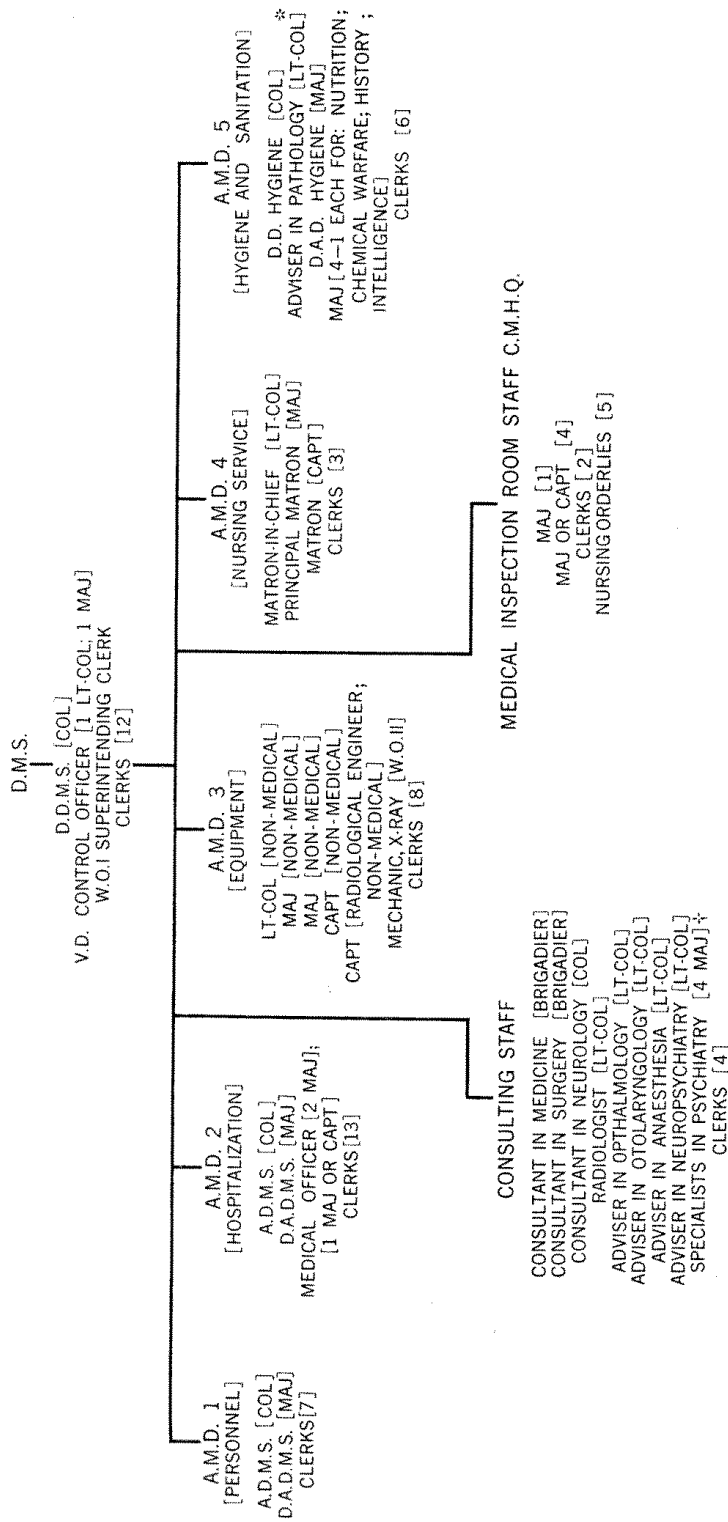
trend was in the opposite direction. In July an adviser in neuropsychiatry was added to the Consultants Department, but compensation was more than obtained by the deletion of five specialists in psychiatry from the establishment. In September, advisers in ophthalmology, otolaryngology, and anaesthesia were also added to the Consultants Department. Against this, the position of Inspector of Hospitals was abolished on 30 November on orders from National Defence Headquarters. The strength of the Directorate of Medical Services on 1 June 1945, following the close of hostilities in Europe, stood at 43 officers and 62 other ranks. The principal appointments at that date are shown in the accompanying chart.

Function

The function of the D.M.S. is difficult to define precisely, since he had a dual role. As the senior overseas representative of the D.G.M.S., he had a general responsibility for the health of all Canadian troops, whether stationed in the United Kingdom or in a theatre of operations, and for the efficiency of the army medical service as a whole. In this capacity he was an adviser rather than an executive. As head of the medical section of the Adjutant-General's Branch at Canadian Military Headquarters, on the other hand, he was directly responsible for the control and administration of all static Canadian medical installations in the United Kingdom, for the medical care of troops under the direct command of Canadian Military Headquarters, and for the treatment of casualties from the time they entered hospital until they were fit for duty or repatriated to Canada.

The D.M.S. maintained full control of the procurement and supply of medical equipment, and a large measure of control over the posting, transfer, and promotion of medical personnel, particularly officers. He also was responsible for all medical records and statistics. The need for such records was recognized early and in March 1940 an officer from his staff was attached to the Overseas Canadian Records Office at Acton to ensure their adequate provision. He determined the policies to be pursued in respect of hygiene and sanitation. To a varying extent, each of these matters was of vital concern to the Army generally, not merely to that part of it under the command of Canadian Military Headquarters. In short, his responsibilities as an adviser and as an executive were in practise so closely interlocked as almost to defy differentiation. In broad terms the most that could be said, perhaps, is that he exercised a close supervision over the whole army medical service up until the time Canadian troops were committed to battle, first in the Mediterranean theatre and then in North-West Europe, whereas subsequently he was less able to influence the field formations in respect of medical matters and became chiefly concerned with the medical installations and personnel remaining in the United Kingdom.

DIRECTORATE OF MEDICAL SERVICES, CANADIAN MILITARY HEADQUARTERS
 [AS AT 1 JUNE 1945]



TOTAL OFFICERS - 43
 TOTAL OTHER RANKS - 62

* ADVISER IN PATHOLOGY TO BE PROVIDED FROM WITHIN THE WAR ESTABLISHMENT OF ONE OF THE STATIC HOSPITALS.
 † FOR ATTACHMENT TO FORMATIONS AS REQUIRED.

Direct Responsibilities

The Reinforcement Units. The Canadian Reinforcement Units, clustered about Bordon, Witley, and Aldershot, constituted the largest body of troops permanently under the command of Canadian Military Headquarters. The six reinforcement holding units authorized in the spring of 1940 were expanded by the end of the war into six reinforcement groups, each composed of a number of reinforcement units according to arms and services, and all under the immediate command of Headquarters, Canadian Reinforcement Units. In the process, it might be added, the holding became of secondary importance to the training of reinforcements.

The first six units were located at Bordon. There the Canadian Medical Centre, established at Aldershot during the winter of 1940-41, was transferred. Subsequently designated No. 1 Canadian Medical Centre, this installation combined the features of a medical inspection room and small hospital. Before the end of 1941 No. 2 Canadian Medical Centre was opened at Witley, No. 3 at Rushmoor, and No. 4 at Cove. All four of these installations, though differing somewhat in size, had similar facilities and identical functions.

From early in 1941 all medical arrangements for the reinforcement units were immediately supervised by an A.D.M.S. attached to Headquarters, Canadian Reinforcement Units. By the end of the war he had a considerable staff, including an Assistant Director of Hygiene, and several permanent medical boards functioned under his direction.

The Canadian Forestry Corps. The Canadian Forestry Corps, which by the early part of 1941 was at work among the timber stands of the Scottish Highlands, presented a problem. Though under the command of Canadian Military Headquarters for all military purposes, it was physically far removed from Canadian medical installations. The Canadian Government had laid down as one of the conditions of providing such a corps that the cost of all medical services save the pay of such R.C.A.M.C. personnel as might be attached, would be borne by the British. But because of possible pension claims, it had declined to accept the findings of British medical boards on Canadian personnel.

The resulting medical arrangements were somewhat complex. Canadian medical officers, headed by a Senior Medical Officer at Headquarters, Canadian Forestry Corps, were attached to the various companies. Personnel requiring hospitalization were sent to British medical installations. Upon discharge from hospital they reported to the Reinforcement Section, Canadian Forestry Corps, for special treatment or convalescence under Canadian medical supervision prior to rejoining their units. Medical boards were conducted entirely by Canadians, and the findings were forwarded to the D.M.S., Canadian Military Headquarters. These and other medical documents, like those of all Canadian personnel overseas, eventually found their way to the Overseas Canadian Records Office, Acton.

The Canadian Fire Fighters. The Corps of Canadian Fire Fighters that was raised for service in the United Kingdom, although strictly speaking a civilian organization, was considered to be part of the Canadian Army overseas for purposes of medical attention and hospital treatment. For this reason it looked to the D.M.S. for advice and assistance on all medical matters.

Shortly after the arrival of the first group of fire fighters in June 1942, it was arranged that they would be admitted to Canadian hospitals on the same basis as Canadian military personnel, that those becoming unfit for service would be returned to Canada in military drafts under R.C.A.M.C. supervision, but that ordinary treatment for minor illnesses would be carried out by local civilian practitioners under the direction of the British Fire Services. In all essential respects, this was the manner in which the medical requirements of the Corps were met throughout its period of service in the United Kingdom.

HOSPITAL POLICY OVERSEAS

THE FIRST STATIC INSTALLATIONS

When Colonel Luton arrived in the United Kingdom as Senior Medical Officer in November 1939, Canadian policy regarding the dispatch of hospitals to the United Kingdom had not yet been finally settled. Unaware of what was being planned in Canada, he adopted the logical course of requesting the British authorities to make space available in some of their hospitals for Canadian patients. By the time Canadian Military Headquarters was notified of the decision to send Canadian hospital units overseas, the British had agreed to the hospital arrangements already outlined. There had been no alternative but to allow these to stand, at least for the time being. Personnel of the two general hospitals (Nos. 5 and 15), which had arrived in England in February, were used to staff the Canadian camp reception stations and infectious diseases hospital. Neither No. 5 nor No. 15 was able to operate as a unit initially, and it was well into the summer of 1940 before either was able to do so. The continued dependence on British hospital facilities throughout the winter was due partly to the legitimate assumption that the major Canadian hospital effort would be in France, but mainly to a lack of accommodation for Canadian hospitals in the United Kingdom.

Meanwhile, construction had begun on the Canadian Red Cross Hospital at Taplow. Lord Astor's offer to lease a part of Cliveden for a purely nominal rental had been readily accepted by the Canadian Red Cross which had established a hospital on the same site in the First World War. The first intention was to build a 300-bed hospital, but a 600-bed installation was finally agreed upon. The society undertook to meet the costs of construction and to provide ordnance equipment, while the Canadian government agreed to staff and operate it as a military hospital and to "provide all medicines, surgical dressings, drugs and other medicinal and surgical stores, and all other furniture, furnishings, medical and surgical appliances, instruments and equipment. . . necessary to operate the . . . Hospital to a proper standard of efficiency and not otherwise provided by the Society".* Construction began early in January 1940, but the earliest date on which even 300 beds were expected to be available was 1 April.

There was a second hospital project under consideration during the winter. On 13 October 1939 Mr. Vincent Massey, Canadian High Commissioner in the United Kingdom, formally offered on behalf of the Massey

* 11 /Hosp/2/2: "Memorandum of Agreement . . . between the Canadian Red Cross Society and His Majesty the King represented-by the Honourable the Minister of National Defence of the Dominion of Canada, 8 April 1940."

Foundation to provide and maintain a fully equipped convalescent hospital of 125 beds for officers and other ranks if the Department of National Defence would make available two medical officers, nine nursing sisters, 18 R.C.A.M.C. other ranks, and the necessary medical and surgical supplies. The Minister of National Defence replied on 22 November that the offer was deeply appreciated and had been "gratefully accepted by the Government" on the basis suggested. After several sites had been considered, one known as "Garnons", near Hereford, was selected. But it was early March 1940 before the matter was thus firmly settled. Because of the need to rehabilitate and equip the premises, some further time had of necessity to elapse before "Garnons" could begin to receive convalescents. When this happened, the accommodation provided was for officers only and the bed capacity was 40.

As regards hospital planning generally, the chief emphasis was placed on providing hospitals for France, though the necessity of retaining a proportion in the United Kingdom was not overlooked. Immediately following the announcement by the Canadian Government on 25 January 1940 that the 2nd Canadian Division was to be sent overseas, Colonel Luton undertook a study of the number of general hospitals that should be provided for the enlarged force in prospect. Assuming the intention was eventually to form a Canadian Corps, he concluded that over and above the two general hospitals already available, three 600-bed and three 1200-bed units would be required. Of these 7200 general hospital beds, estimated to be ten per cent of the ration strength of the force, 4800 would be in France and 2400 in the United Kingdom. When early in March detailed information on projected overseas troop movements was received from Ottawa, it became possible to prepare a more specific programme, which was transmitted to Canada on 18 March. But it developed that the additional hospital units had been noted for consideration with the estimates for 1940-41 which had not yet been approved. The Cabinet Committee on War Finance and Supply therefore suggested that existing requirements might be satisfied by the dispatch of 1800 beds as soon as mobilization and equipping could be effected. In fact, the only programme ever agreed upon before events on the Continent completely altered the situation was that No. 1 Neurological Hospital, already mobilized and equipped, would be dispatched from Canada in June and that a 1200-bed unit would follow at an unspecified date.*

In the circumstances outlined, especially with the buildings for No. 5 General Hospital only in the process of construction, with No. 15 General Hospital and No. 4 Casualty Clearing Station earmarked for duty in France, and with hospital accommodation at such a premium that temporary quarters for these units were virtually out of the question even had such an arrangement been desirable, the R.C.A.M.C. could hardly have done much more than it did towards providing full Canadian medical facilities in the United

*All important documents relating to the projected hospital programme are to be found on 1 /Hospital /1.

Kingdom during the first winter of the war. It is cause for reflection, nevertheless, that in consequence the main burden of care for Canadian sick in hospital fell upon the British. The total number of Canadians admitted to hospital from December 1939 to the end of April 1940 was 4555. This represented, taking the average overseas strength for the five months as 18,000, an average monthly sick rate of 48.4 per 1000. The peak day was 19 March, when 504 Canadians were receiving treatment in one or other of the five main medical installations available in the Aldershot area, of which all but the small Canadian Medical Centre were British.

A measure of success in the search for accommodation was achieved when a suitable site for a convalescent depot was found at Dolphin Camp, Brixham, Devonshire. Moreover, a hospital under construction by the British near Bramshott, Hampshire, was selected as the most suitable location, if it could be secured, for the new 600-bed unit that it was hoped would be available by 1 July. The necessary authority to rent Dolphin Camp as a site for a convalescent depot and to apply to the War Office for the hospital accommodation at Bramshott was soon forthcoming.

Dolphin Camp was secured by 25 May and No. 1 Convalescent Depot took over the property a few days later. Having functioned for some time at Bordon, England, it was able to open in its new location almost immediately. *

Shortly before this, on 18 May, the War Office agreed that the R.C.A.M.C. should staff and operate the 600-bed hospital nearing completion at Bramshott, though stipulating that it should be under the general administration of the D.D.M.S., Aldershot Command, and be open to British as well as Canadian Troops. The plan to send No. 15 to France having been abandoned by 24 May, this unit was chosen to occupy Bramshott, and on the 29th an advance party moved in. Two days later the main body arrived and by 1 June, although many of the primary necessities of a hospital, such as operating room and kitchens, were still not ready for use, the first patient was admitted. Bramshott Hospital was not actually declared open until 1 July.

No. 5 General Hospital did not open at Taplow until somewhat later. Hopes of having the buildings ready for partial occupancy by 1 April and completely finished by 1 June were unfulfilled as a number of difficulties delayed construction. It was the latter part of May before even an advance party was able to occupy the premises and over a month later before the hospital was ready to function. On 16 July, in the presence of a distinguished gathering, Mr. R. B. (later Viscount) Bennett, on behalf of the Canadian Red Cross Society, formally presented Taplow Hospital to the Canadian

* No. 1 Convalescent Depot remained at Brixham, Devonshire, until the end of April 1943, when it was transferred to Hindhead, Surrey. Shortly thereafter it departed for the Mediterranean theatre and was replaced by No. 2. This unit left Hindhead in April 1944 for Hunmanby, Yorkshire. There No. 4 took over on 9 June 1944, moving to Farnborough, Hampshire on 2 August. No. 3 did not operate as a convalescent depot in England; soon after its mobilization in May 1944 it was sent to France.

Government in the person of Mr. Vincent Massey. The first patient was admitted on 25 July, and it is of interest that he was a British rather than a Canadian soldier.

THE REVISED PROGRAMME FOR 1940

The forecast of overseas hospital requirements prepared by Canadian Military Headquarters during the early months of 1940 was rendered almost valueless by the allied disaster in France. In the latter part of July the whole question of overseas hospitalization came under review following an enquiry from National Defence Headquarters as to whether there was any change in the previous estimate of hospital requirements. On 31 July the problem was considered at a conference of senior Canadian officers presided over by Lieutenant-General McNaughton. The D.M.S. intimated that the Ministry of Health had earmarked a large number of beds for casualties. So far as existing Canadian facilities were concerned, he pointed out that two Canadian hospitals of 600-beds were now established in England (No. 15, though a 1200-bed unit, had only 600 beds available at this time), that a third one of the same size was to arrive shortly and that No. 1 Neurological Hospital was expected to open soon as a 200-bed installation. Moreover, additional beds could be made available by expanding the facilities at Bramshott and Taplow and by employing No. 4 Casualty Clearing Station as a hospital. Since 3000 beds, which on the basis of an anticipated overseas strength of 60,000 would be five per cent or double the scale laid down by the War Office, could be made available, he concluded that there was ample accommodation and no need for more medical units at the time. With this conclusion the conference concurred.

Authority was then sought from Ottawa for the construction of sufficient huts to expand Taplow to 1000 and Bramshott to 1200 beds. In addition, it was recommended that no additional hospital units should be sent overseas until a definite change in the existing situation could be foreseen, but that a number sufficient to raise the overseas bed state to ten per cent of the force should be partially mobilized and completely equipped ready for dispatch at one month's notice. National Defence Headquarters refused to sanction any additional construction at Taplow, and suggested that No. 8 General Hospital be sent overseas instead. But this was not acceptable to the overseas authorities as there was absolutely no accommodation in sight for another hospital. In any case, by the end of August it was found that both Taplow and Bramshott could be expanded by 300 beds each even without extra huts. As to whether hospitals were partially mobilized in Canada on the scale recommended, there is no satisfactory documentary evidence. But it would appear that some effort was made in this direction.

Meanwhile, on 5 August, the Massey Foundation Convalescent Home for Canadian Officers had been opened at "Garnons", Staunton-on-Wye,

nine miles north-west of Hereford. On 20 August No. 1 Neurological Hospital took over the accommodation secured for it at Hackwood Park, near Basingstoke, and by 28 September it was ready to receive patients. Owing to space limitations considerable time elapsed before it was able to function at its intended capacity of 200 beds.

The last major development of 1940 was the opening of No. 1 General Hospital at Marston Green, Coleshill, about five miles east of Birmingham. Though not very suitable geographically, this was the only site obtainable. The buildings, leased from the Ministry of Health, were occupied on 26 October. As no nursing sisters were yet available, it was decided not to accept patients for the time being. But the heavy air raids on the Birmingham-Coventry area in the middle of November produced a situation in which the hospital could not well continue to be left empty. Accordingly, some 140 children, evacuated from various hospitals in Birmingham, were admitted together with sufficient nurses to look after them. The Canadian nursing sisters arrived in December and on 9 January 1941 the first military patients were admitted.

PLANS FOR EXPANSION, 1941

The number of Canadian hospital beds in the United Kingdom during 1940 remained below the total originally anticipated. Since July, in the absence of serious epidemics and battle casualties, those available had proved sufficient for the treatment of the majority of Canadian patients. But early in 1941, following the Government's decision to send overseas during the course of the year the balance of the corps troops required for a Canadian Corps of two divisions, plus the 1st Army Tank Brigade, the 3rd Division, and the 5th Armoured Division, it became obvious that further hospital facilities were essential.

Accommodation remained a problem. To a Canadian suggestion that Pinewood Hospital (300-350 beds) at Crowthorne, Cambridge and Connaught Hospitals in the Aldershot vicinity, plus a new 1000-bed installation under construction at Horley, should all be turned over to the R.C.A.M.C., the War Office replied that at the most Horley and Pinewood or Cambridge and Connaught could be released, and that it would much prefer to retain the latter two. Eventually, on 21 April 1941, a compromise was reached whereby Canadian operation of the Connaught and Pinewood Hospitals was agreed upon.

It had already been arranged that No. 14 General Hospital (1200 beds) would be dispatched overseas in May to staff whatever two installations were secured through these negotiations. Other than this unit, there were only two 600-bed general hospitals immediately available in Canada.

Asked in March for a statement of overseas hospital requirements, Canadian Military Headquarters replied on 8 April that this was difficult to

give due to the inability to foresee the type of operations in which Canadians might be employed. In a theatre of operations outside the United Kingdom, hospital beds on the basis of ten per cent of the strength of the force would be required, amounting to approximately 10,000, in view of a possible Canadian overseas strength of 100,000. For this contingency, another 4800 beds in either 600 or 1200-bed units would have to be mobilized in Canada. If the field force remained in the United Kingdom, then hospital beds should be provided on the basis of five per cent of its strength. But accommodation for even this number was impossible to obtain, and in an emergency British facilities would have to be used. Thus far there had been no great difficulty in caring for Canadian patients in Canadian hospitals. There was in sight including casualty clearing stations, a total of 4200 beds. This, from past experience, should prove ample unless the situation greatly changed, although it would be advantageous to have an additional 600-bed as well as the 1200-bed hospital scheduled to arrive in May. In view of the uncertainty of future operations and assuming that one of the 600-bed hospitals now mobilized could be brought to the United Kingdom during the summer, it was considered that mobilization of further units should be deferred until more definite information was available. National Defence Headquarters agreed with this view, and accepted the figure of 10,000 hospital beds as the ultimate maximum requirement in the event of operations outside the United Kingdom.

An advance party from No. 14 General Hospital arrived in the United Kingdom in time to take over Pinewood Hospital from the outgoing British unit on 16 June as scheduled. The main body reached Pinewood on 12 July. But the taking over of Connaught Hospital by part of this unit was seriously delayed; it was 1 October before Connaught was turned over to the R.C.A.M.C., and the end of the month before it began to function as a Canadian military hospital. Though located at Farnborough, it became in Canadian terminology the Aldershot Hospital.

A nursing sisters' convalescent home, with a capacity of about 35, was established at Digswell Place, Welwyn, Hertfordshire, during the latter part of March. With this exception, the only important addition to the static medical facilities in the United Kingdom during the first ten months of 1941 was No. 14 General Hospital. A review of the situation in the latter part of August resulted in the conclusion that the picture presented to National Defence Headquarters in April remained substantially unchanged. It was not until the closing months of the year that it became possible even to consider a further expansion.

Towards the end of September, National Defence Headquarters reported that No. 7 General Hospital (600 beds) would be ready to proceed overseas at an early date if there were accommodation for it. Lest there be a repetition of the difficulties encountered in administering No. 1 General Hospital, isolated as it was from the majority of troops to be served, Canadian Military Headquarters was at first hesitant about accepting the unit. But since No. 14,

operating Pinewood, was scheduled to send a detachment to occupy the Aldershot Hospital almost immediately, it was finally decided that there was space for another general hospital. It could take over Pinewood thus enabling No. 14 to employ its full resources at Aldershot. Arrangements for No. 7 to proceed overseas were therefore completed.

On 31 October National Defence Headquarters precipitated another complete review of the overseas hospital programme. Once No. 7 departed there would be only one general hospital-No. 8-left in Canada, and it was desired again to have the opinion of Canadian Military Headquarters on whether more should be mobilized. In a reply dated 13 November, it was pointed out that the difficulties in estimating the total hospital requirements remained substantially unchanged. It was, however, recommended that equipment for hospitals totalling 6000 beds be assembled and held in readiness against the time when mobilization of further units themselves would become necessary. Meanwhile, further accommodation had been acquired at Horsham, Sussex. No. 7, originally destined for Pinewood, was chosen to occupy the new site, and it was requested that No. 8 be dispatched forthwith to take over Pinewood.

THE 1941 PROGRAMME COMPLETED

In the field of policy this was the last important development prior to May 1942, when hospital planning received a new impetus and took, to some extent, a new direction. In the interval the modest programme of expansion was largely completed. The details were somewhat altered in the process, owing to the dual problem of making an equitable distribution of units among the available sites and of providing sufficient staffs for what were progressively becoming fully static rather than mobile field hospitals.

No. 7 General arrived in the United Kingdom on 24 November 1941. But instead of taking over Horsham Hospital as had so recently been decided upon, it relieved No. 1 at Marston Green. No. 8 did not arrive overseas until 24 March 1942, and on the following day it moved directly into Pinewood Hospital.

In April the War Office agreed to release for Canadian use, with effect from 20 May, a group of hospital buildings at Horley, Surrey. With more accommodation than units once again in prospect, National Defence Headquarters was asked for another 600-bed hospital, if possible in June, but not later than early July. Between 20-25 May, as an interim solution, No. 14 moved to Horley, No. 8 vacated Pinewood to take over the Aldershot Hospital, and No. 6 Casualty Clearing Station, which had arrived on 29 March, moved into Pinewood to function as a convalescent hospital.

At the end of May 1942, there were six Canadian general hospitals open in the United Kingdom, one neurological hospital, and one casualty clearing station acting temporarily as a convalescent hospital:



NO. 8 GENERAL HOSPITAL, CROWTHORNE, ENGLAND

A view of one of the wards of this 600-bed unit, April 1942.

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| | | |
|--------|---|----------|
| No. 1 | Canadian General Hospital, Horsham..... | 600 beds |
| No. 5 | Canadian General Hospital, Taplow | 600 beds |
| No. 7 | Canadian General Hospital, Marston Green | 600 beds |
| No. 8 | Canadian General Hospital, Aldershot..... | 600 beds |
| No. 14 | Canadian General Hospital, Horley | 900 beds |
| No. 15 | Canadian General Hospital, Bramshott..... | 900 beds |
| No. 1 | Canadian Neurological Hospital, Basingstoke..... | 250 beds |
| No. 6 | Canadian Casualty Clearing Station, Pinewood..... | 350 beds |

Available as auxiliary installations were No. 1 Convalescent Depot at Brixham, the Massey Foundation Convalescent Home for Canadian Officers at Staunton-on-Wye, and the Digswell Place Nursing Sisters Convalescent Home at Welwyn. A Canadian plastic surgery unit was available at Park Prewett Hospital near Basingstoke.

INITIAL EFFECTS OF OPERATIONAL PLANNING

From the fall of France in 1940 until the spring of 1942 the provision of Canadian hospitals overseas was dependent not so much upon the theoretical requirement in military hospital beds as upon the availability of hospital accommodation. During this period there was little chance of Canadian troops being engaged in operations outside the United Kingdom, and against any sudden emergency the facilities of British civil hospitals were always at hand. The policy therefore adopted was to provide beds equivalent in number to five per cent of the Canadian strength state, although in practice this was not always possible. An eventual operational need for beds on double this scale was considered probable, but tended to receive less and less attention. The net result was that at the end of May 1942 there were eight Canadian hospital installations in the United Kingdom with a combined bed capacity of 4800. Another 600-bed general hospital had been asked for not later than early July.

By this time the general military situation had altered. The British and American Governments had decided in April that a full-scale invasion of France would be the principal allied effort against Germany and had tentatively arranged that it should take place in the summer of 1943 as Operation "Roundup". By May 1942 planning for this project was well under way.

This development, combined with the anticipated increase of strength consequent upon the formation of the First Canadian Army, not only brought long-term hospital requirements once again to the fore but necessitated an intensive review of existing plans to meet current needs in the United Kingdom. Canadian hospital policy now became inextricably entangled with that of the British, and, to a lesser extent, with that of the Americans. In this, as in other matters, joint planning and a common policy were prerequisites of a proper balance between purely national interests and those of the allied forces as a whole. Although it was later found necessary

to defer Operation "Roundup", planning for it continued, if intermittently. Prospective operational requirements thus remained the background against which Canadian hospital policy had to be developed.

It was on 27 April 1942 that Brigadier Luton, the D.M.S., Canadian Military Headquarters, first met with British and American representatives to consider the medical aspects of Operation "Roundup". At this meeting it was agreed that although following an invasion there would necessarily be a time-lag before hospitals could be established in Europe, hospital beds on the full scale of ten per cent for British, American, and Canadian forces should be made available in the United Kingdom beforehand. A proportion would be moved to the Continent as soon as a bridgehead of sufficient depth was secured. In the light of this decision, and of an expected Canadian overseas strength of 180,000 by the end of 1942, Brigadier Luton undertook to staff and maintain 18,000 beds.

The more pressing problem in Canadian eyes was that of providing 9000 of these beds by December, since there was general agreement that despite the prospective difficulties in securing accommodation, a minimum number of beds equal to five per cent of the Canadian troops in the United Kingdom should be available. The immediate programme decided upon by the end of May, therefore, was the progressive addition of 4200 beds to the 4800 already established.

To effect this increase, National Defence Headquarters was asked early in June to send overseas as scheduled the 600-bed general hospital previously requested, to provide in August the two other 600-bed units that were already mobilized, and to raise four more for dispatch, two in September and two by December. All this was to be conditional upon the acquisition of sufficient accommodation by the sailing dates suggested, as room for only two more hospitals was definitely in sight.

On 31 July, following the receipt of information that the planned strength of the Canadian Army Overseas by the end of 1942 was 195,000, another two 600-bed general hospitals were added to the above statement of immediate requirements. At the same time Ottawa was informed that to meet the agreed operational needs of a composite British-American-Canadian force outside the United Kingdom, provision should be made for additional hospital units totalling 10,000 beds.

During the latter part of 1942 definite progress was made towards increasing bed capacity in the United Kingdom. Authority was granted to enlarge and improve existing hospital installations to provide approximately 1000 additional beds. Other sites were acquired and additional hospitals were dispatched overseas to occupy them. The new hospitals and their locations were as follows :

| | | | |
|--------|---------------------------|-----------------|-----------|
| No. 10 | Canadian General Hospital | 1200 beds | Watford |
| No. 16 | Canadian General Hospital | 600 beds | Cuckfield |

| | | |
|----------------------------------|----------------|-----------|
| No. 17 Canadian General Hospital | 600 beds | Pinewood* |
| No. 1 Canadian General Hospital | 300 beds | Hellingly |
| Alton Convalescent Hospital | 350 beds | Alton |

Moreover, late in October two British military camps, Cherry Tree and Roman Way, in the vicinity of Colchester, Essex, were inspected by a Canadian medical authority and found reasonably suitable for hospital purposes. These, the War Office subsequently made available for Canadian use.

LONG-TERM HOSPITAL PROGRAMME APPROVED

By the end of the year 1942 the problem of hospital accommodation in the United Kingdom was less serious; in fact it was now overshadowed by that of reaching a common understanding with National Defence Headquarters as to the ultimate aim of the overseas hospital programme. Beyond agreeing to provide enough to meet estimated minimum requirements if the necessary accommodation could be found, National Defence Headquarters had thus far not committed itself to the authorization of any specific number of hospitals for overseas service. The ultimate size, composition, and organization of the First Canadian Army had still to be determined. Pending a settlement of this problem, it was considered that no decision on the full hospital programme recommended by Canadian Military Headquarters could be taken. Another probable reason, though it was not put forward specifically, was the accumulating evidence that Operation "Roundup" would not in fact take place as scheduled.

It was not until 1 March 1943 that National Defence Headquarters had been provided with a reasonably firm estimate both of the Canadian quota of troops for a joint British-Canadian expeditionary force and of the units to be retained in the United Kingdom under the command of Canadian Military Headquarters. Ultimate requirement in hospitals was given as follows: for the expeditionary forces two 200-bed, five 600-bed, and seven 1200-bed general hospitals; for the United Kingdom, seven 600-bed, one 900-bed, two 1200-bed general hospitals, one neurological, one convalescent, and one special hospital,— a total of 24 general hospitals and three of other types.

A proportion of the 24 would at all times function as static hospitals in the United Kingdom, but none would be tied to any particular static establishment, to avoid the necessity of a permanent distribution between the United Kingdom and a theatre of operations. The nine installations already occupied by general hospitals, plus Cherry Tree Camp, Colchester, would constitute the static hospital organization in the United Kingdom apart from special hospitals; one more 600-bed unit, to operate Cherry Tree, would therefore complete this. Against the remaining requirement of 15, only two hospitals

* No. 17 General Hospital replaced No. 6 Casualty Clearing Station at Pinewood.

were available in Canada necessitating the mobilization of another 13. On 4 May 1943 the Privy Council approved the formation of these 13, bringing to 24 the total number authorized.

By the middle of May 1943 the D.M.S. had decided that Roman Way Camp, just across the road from Cherry Tree, should be turned into a 1200-bed convalescent hospital for other ranks. Alton Convalescent Hospital would then be utilized for officers, Alderbrook Park, Cranleigh, Surrey, was to be acquired as a 50-bed convalescent hospital for female officers. In outline at least, the overseas hospital programme had at last been moulded into something approaching its final form. There were available or in prospect 19,600 beds in general hospitals, 900 in special hospitals, and 1600 in convalescent hospitals,—a total of 22,100 beds.

There had already been suggestions that the number of Canadian hospitals earmarked for service outside the United Kingdom might have to be reduced, in order to cut down the size of the administrative "tail" of the force that was to invade North-West Europe. Of the 13 additional general hospitals so recently authorized, it had consequently been decided that only six should mobilize immediately. In succeeding months, as planning for a cross-channel invasion went forward with increasing intensity, additional reasons for reducing the hospital commitment were advanced. In June, for example, the Canadian Army Planning Committee suggested that two 600-bed and five 1200-bed general hospitals should be deleted from the Order of Battle in order to effect a manpower saving. Later, a good deal of doubt developed in non-medical circles as to whether the proper method of computing hospital requirements was to take ten per cent of the anticipated total strength of the Canadian Army Overseas. After a visit to North Africa, Lieutenant-General McNaughton in particular became much concerned over the possibility that this estimate was too liberal.

To all such suggestions the D.M.S. offered strong objections, and in this he was fully supported by Brigadier A. W. Beament, the Deputy Adjutant General, Canadian Military Headquarters. Discussions with senior British and American officers disclosed a continuing belief that the total number of hospital beds should equal at least ten per cent of the force to be engaged in any theatre of operations, irrespective of where that theatre might be or of what proportion of the ten per cent was located in the United Kingdom. Canadians and Americans had particularly to consider the facilities available for further evacuation across the Atlantic. This in itself seemed to require a somewhat higher scale of provision than might have been thought necessary on the basis simply of the number of casualties to be expected. The dispatch of a Canadian force to the Mediterranean theatre had further complicated the purely Canadian problem. By June, the departure with this force of Nos. 5 and 15 General Hospitals necessitated the temporary closing of two hospital installations in the United Kingdom.

The net result of all this was that by the middle of August 1943 it had been more or less firmly agreed by the Canadian authorities in the United Kingdom, not only that there should be no reduction in the 22,100 hospital beds already authorized or planned, but that since the strength "ceiling" of the Canadian Army Overseas had been raised to approximately 233,000, the minimum number of hospital beds of all types should be increased to 23,000.

Further consideration of the problem in September produced only one important change in this conclusion. It was then decided that the extra 1200-bed general hospital needed to bring the total bed state up to 23,000 would not be demanded until experience confirmed that the application of an empirical rate of ten per cent to the total strength state was in fact the proper method of determining the number of hospital beds required. Full details of the programme thus decided upon, of the underlying considerations, and of what had still to be done to implement it, were forwarded to Canada on 1 October. Included was a request that of the 13 new hospital units authorized in May the seven remaining to be mobilized should be prepared for dispatch overseas during April, May, and June 1944.

THE COMPLETED PROGRAMME

While these policy decisions were in the process of being reached, eight new hospitals arrived, Nos. 13 and 18 at the end of July, Nos. 2, 3, 6, 9, 11, and 12 about the middle of September. Nos. 5 and 15 were in the Mediterranean theatre and Nos. 1 and 14 were preparing to go in October. A good deal of readjustment within the static medical organization in the United Kingdom during the summer and early autumn of 1943 was therefore necessary. The changes involved are tabulated below:

| | | | | |
|--------|---------------------------|-----------|---|-----------------------|
| No. 2 | Canadian General Hospital | 1200 beds | — | Bramshott |
| No. 3 | Canadian General Hospital | 200 beds | — | First Canadian Army * |
| No. 6 | Canadian General Hospital | 200 beds | — | First Canadian Army |
| No. 7 | Canadian General Hospital | 600 beds | — | Taplow |
| No. 9 | Canadian General Hospital | 600 beds | — | Horsham |
| No. 11 | Canadian General Hospital | 600 beds | — | Temporarily inactive |
| No. 12 | Canadian General Hospital | 1200 beds | — | Horley |
| No. 13 | Canadian General Hospital | 600 beds | — | Cuckfield |
| No. 16 | Canadian General Hospital | 600 beds | — | Marston Green |
| No. 18 | Canadian General Hospital | 600 beds | — | Cherry Tree† |

There were no further important developments until 1944. Then, in January, Alderbrook Park Convalescent Hospital (50 beds), originally intended for female officers only, was opened for female personnel of the Canadian forces overseas, officers and other ranks. At the end of February

* Left for Italy, 13 January 1944.

†Took over temporarily from No. 15 at Bramshott until replaced by No. 2 in September.

Alton Convalescent Hospital was reduced to nil strength, although remaining an authorized unit, and its staff was transferred to Roman Way Camp as the nucleus of a 1200-bed convalescent hospital to be established there. The Alton site was then occupied by No. 1 Special Hospital, which at Hellingly was found to be an undesirable distance from the main body of Canadian troops.

These developments were in themselves relatively unimportant. But because of the fixed manpower ceiling, even a small change in agreed plans as to the composition and organization of the Canadian Army Overseas had wide repercussions and evoked the closest scrutiny. Early in 1944 it was discovered that the War Office was expecting more Canadian hospital beds to be allotted to the 21st Army Group for Operation "Overlord", as the attack on North-West Europe was now designated, than Canadian Military Headquarters was intending to provide. An answer to this problem became imperative, especially when it was suggested that the Canadian allotment of hospital beds be reduced even further; in fact, from 8000 to 6000. This, it was argued, would satisfy Canadian requirements according to the agreed scale of hospital provision.

But the British indicated that they were having great difficulty in finding their share of hospital beds for North-West Europe. They stated that their existing scale of provision was only 4.7% against an estimated minimum requirement within the theatre of 6%. If 8000 Canadian beds could be allotted, it would materially improve the situation. The D.M.S., though desirous of sending another 600-bed unit to Italy, inclined to the opinion that the British request for assistance should be met. He pointed out that if the force as a whole were short of hospitals, necessitating large-scale evacuations to the United Kingdom, the time required for the recovery of casualties would be much increased. The upshot of the matter was a Canadian decision on 22 April to send 8000 hospital beds to the Continent, and thus make a contribution to the overall requirements of the 21st Army Group.

The pros and cons of having the full 23,000 Canadian hospital beds theoretically required according to the ten per cent principle had also been re-studied by this time. The conclusion reached was that the extra 1200-bed unit needed to make up this quota could be dispensed with. Apart from the almost insuperable problem of finding any more hospital accommodation in the United Kingdom, a survey of existing installations had disclosed that in an emergency they were capable of handling some 2000 patients in excess of their normal combined capacity.

At 15 May 1944, on the eve of the invasion of Normandy, the total number of authorized hospital beds of all types was therefore 22,100. The beds that could actually be counted upon was only slightly less, as illustrated in the accompanying table. Alton Convalescent Hospital had been rendered dormant. The static general hospitals in the United Kingdom combined had

a normal bed capacity of only 7400 against the theoretical one of 7800. But in Italy, Nos. 14 and 15 General Hospitals had each been given a temporary increment of 300 beds.

During the early part of May 1944, in preparation for duty in North-West Europe, No. 8 General Hospital at Aldershot, No. 10 at Watford, and No. 16 at Marston Green, were reorganized on their appropriate field establishments. They were replaced respectively by Nos. 4, 19, and 20, newly arrived from Canada. For the same reason No. 11, thus far inactive, had in April relieved No. 7 at Taplow. The static medical organization in the United Kingdom as it existed immediately following this readjustment is outlined at Appendix "E". It remains to note that four more hospitals, Nos. 21, 22, 23, and 24, arrived in the United Kingdom by July 1944, thereby bringing the total of general hospitals overseas to 24 with a total bed capacity of 19,600. With the special hospitals (Basingstoke and No. 1 Special) included, beds were provided for 7.8% of the Canadian force overseas in July 1944. If the two convalescent hospitals are included in the percentage calculations, as appears to have been the case in the planning, then the percentage at that time was 8.1.

AUTHORIZED GENERAL AND OTHER HOSPITAL BEDS
AT 15 MAY 1944

General Hospitals

| TYPE | U.K. | | AAI | | 21 ARMY GROUP | | TOTAL | |
|---|------|--------|-----|-------|---------------|-------|--------|--------|
| | No. | Beds. | No. | Beds | No. | Beds | No. | Beds |
| 200-bed | | | 1 | 200 | 1 | 200 | 2 | 400 |
| 600-bed | 7 | 4,200 | 2 | 1,200 | 3 | 1,800 | 12 | 7,200 |
| 1200-bed | 3 | 3,600 | 2 | 2,400 | 5 | 6,000 | 10 | 12,000 |
| TOTAL | 10 | 7,800* | 5 | 3800† | 9 | 8,000 | 24 | 19,600 |
| Other Hospitals in the United Kingdom | | | | | | | | |
| Plastic Neurological and Plastic Surgery Hospital | | | | | | | 600 | |
| No. 1 Canadian Special Hospital | | | | | | | 300 | |
| Roman Way Convalescent Hospital | | | | | | | 1,200 | |
| Alderbrook Park Convalescent Hospital..... | | | | | | | 50 | |
| Alton Convalescent Hospital | | | | | | | 350 | |
| TOTAL (other hospitals)..... | | | | | | | 2,500‡ | |

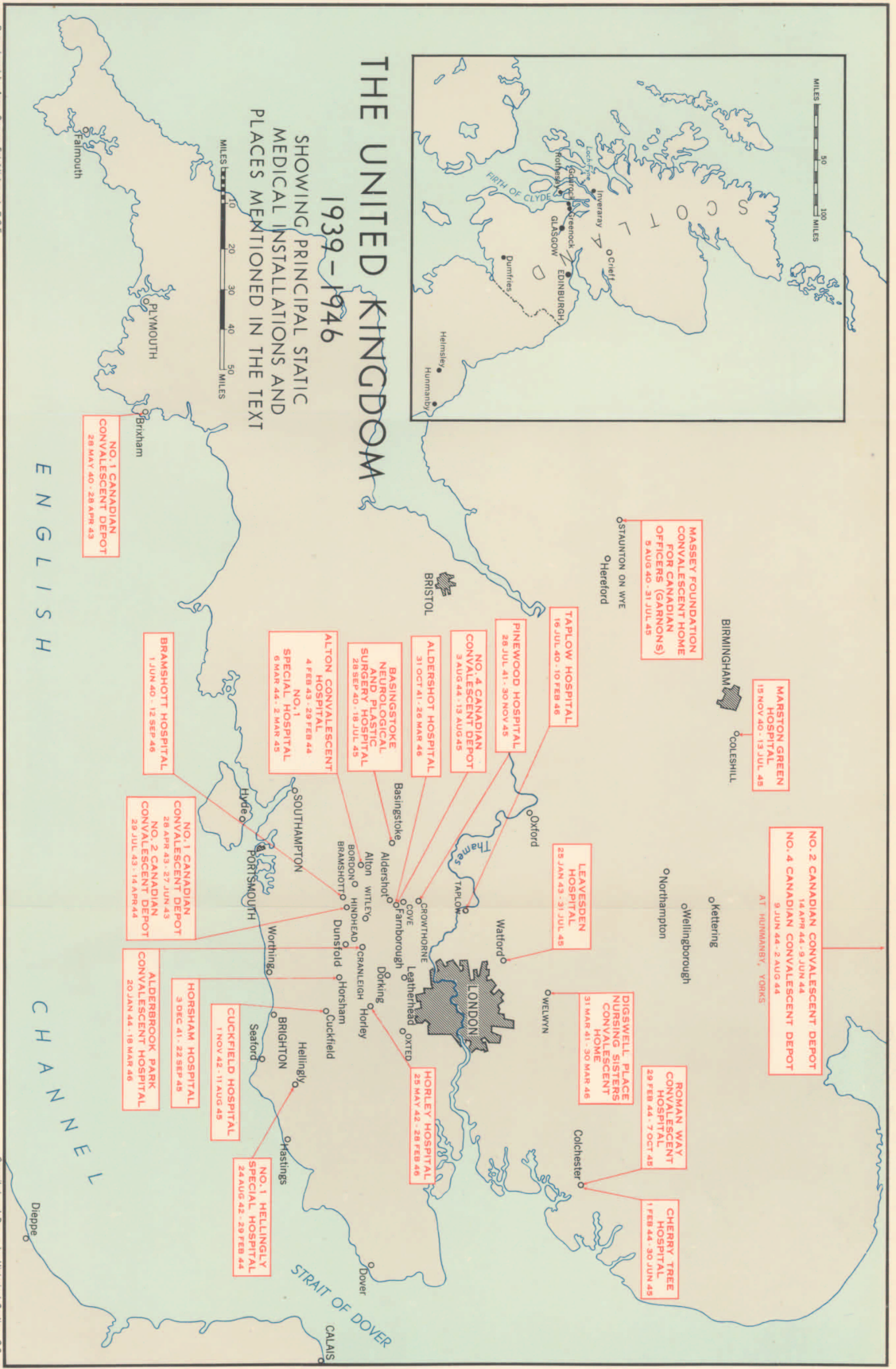
* Static capacity 7400, leaving 400 beds in effect dormant.

† Plus 600 increment beds temporarily authorized, 300 each of Nos. 14 and 15 General Hospitals.

‡ Less the 350 dormant beds in Alton Convalescent Hospital.

Summary

| | |
|--|--------|
| General Hospital beds allotted field force | 11,800 |
| General Hospital beds in United Kingdom..... | 7,800 |
| | <hr/> |
| Total in General Hospitals | 19,600 |
| Other hospitals in United Kingdom..... | 2,500 |
| | <hr/> |
| Total authorized beds..... | 22,100 |
| Less dormant beds | 750 |
| | <hr/> |
| Total normal active beds..... | 21,350 |
| Increment beds..... | 600 |
| | <hr/> |
| Net Total..... | 21,950 |



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Compiled and Drawn by Historical Section, G.S.

THE DIEPPE RAID

The first serious test of the Canadian Army medical service in the Second World War developed with the raid on Dieppe on 19 August 1942. Arrangements in the United Kingdom for the reception, distribution, and treatment of the anticipated casualties had to be made at very short notice. These had to be even more hurriedly modified when it developed that the number of casualties exceeded expectations and that a great many of them were to be disembarked elsewhere than at the appointed places. In spite of these last moment modifications and changes, the emergency was successfully met. Although 17 officers and 117 other ranks of the R.C.A.M.C. accompanied the raiding force, only seven officers and 21 other ranks were able to reach the beaches. Those who gained the shore rendered heroic and invaluable service to the wounded, while of those who did not land some were able to give welcome assistance to naval medical personnel. R.C.A.M.C. casualties during the operation are tabulated as follows:

| | <i>Officers</i> | <i>Other Ranks</i> | <i>Total</i> |
|-------------------------|-----------------|--------------------|--------------|
| Killed..... | 1 | 4 | 5 |
| Wounded (returned)..... | 1 | 3 | 4 |
| Wounded (P.O.W.)..... | 2 | 2 | 4 |
| Unwounded (P.O.W.)..... | 2 | 9 | 11 |
| | — | — | — |
| TOTAL..... | 6 | 18 | 24 |

All of these occurred among the few who landed, of whom only one officer and three other ranks returned to England unscathed.

THE MEDICAL PLAN

Medical arrangements were a navy responsibility afloat, an army responsibility ashore. The chief object of the joint medical plan evolved was the quick collection and early evacuation of battle casualties.

Regimental medical officers were to land with the assault waves of their respective battalions, establish regimental aid posts as soon as possible in the vicinity of the beaches, and re-establish them in successive positions inland as the battle progressed. Unit casualties were to be taken to the regimental aid posts in the normal manner by regimental stretcher bearers. In the early stages of the attack, if practicable, casualties were to be removed directly from regimental aid posts to landing craft of the follow-up waves for quick evacuation. As soon as the battle moved inland, five detachments from No. 11 Field Ambulance were to land on the main beaches in front of Dieppe. One was to establish a beach collecting post on the east side of the harbour about 400 yards inland, while another opened a forward collecting post about 900 yards inland on the west side. The remaining sections were to evacuate to

these posts or other suitable points all casualties held in regimental aid posts or on the various beaches. One section of No. 11 Field Ambulance was to land with the Royal Regiment of Canada on the left flank, at Puy. The work of evacuation was to be facilitated by the use of jeeps fitted to carry stretchers.

Four tank landing craft, each carrying two naval medical officers and 11 sick berth attendants, were to ground on the main beaches an hour before the time scheduled for the withdrawal of the force to evacuate the casualties collected by the field ambulance. Each craft was equipped to hold 100 stretcher cases and 60 walking wounded.

The whole scheme of evacuation would be supervised and co-ordinated by a senior navy medical officer until the casualties landed in the United Kingdom, when distribution by motor ambulance convoy would be under the direction of the D.D.M.S., 1st Canadian Corps.

In preparation for its role in the attack, No. 11 Field Ambulance was sent late in May to the Isle of Wight where it underwent an intensive training programme. In view of the nature of the operation, attention was given to assault landing craft training in co-operation with the Navy. Thus, during an exercise on 4 June, the unit evacuated "token" casualties from assault landing craft to a beach advanced dressing station, and vice versa. Opposed and unopposed landings were practised. The unit participated in large-scale exercises, veritable rehearsals for the raid, on 11-12 and 22-24 June on a stretch of the Dorset coast.

It was intended that the enterprise should take place on 4 July, but unsuitable weather conditions three times forced postponement. The weather conditions still being unfavourable on the 7th, the operation was cancelled. Before long, however, it was decided to revive it. On grounds of security, further combined operational training was dispensed with, and such preparation as No. 11 Field Ambulance now underwent, therefore, consisted of individual and unit training.

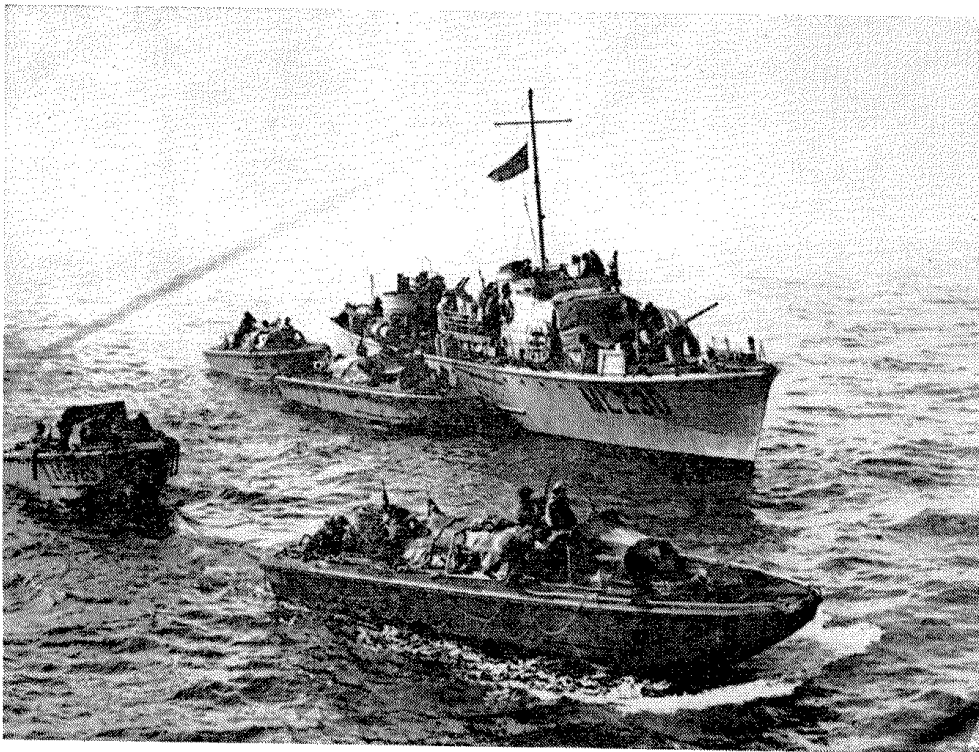
MEDICAL ASPECTS OF THE ASSAULT

With the utmost secrecy the raiding force was assembled at various ports during the afternoon and early evening of 18 August. Most of No. 11 Field Ambulance embarked at Newhaven; one bearer section joined the Royal Regiment of Canada at Portsmouth. Medical equipment and stores were limited to hand-carry but were ample for the task. The raiding craft began to depart about 9:30 p.m. One incident marred the embarkation proceedings at Southampton when a grenade explosion aboard one of the ships injured some 20 men of the Black Watch (Royal Highland Regiment) of Canada and necessitated their evacuation to a nearby hospital. At Puy the Royal Regiment of Canada met almost instantaneous disaster. The first two assault waves were received with a murderous fire. By



THE DIEPPE RAID

These photographs show Canadian casualties being transferred from landing craft to motor launches off Dieppe, 19 August 1942.



the time the third wave landed, the unit was so decimated that there was no prospect of reaching the objective. The regimental medical officer landed with the second wave but was soon wounded, a fate that also befell most of his stretcher bearers. The attached section from No. 11 Field Ambulance was not much more fortunate. The medical officer of this section with a small group of his men managed to get ashore, but the exposed beach was under merciless fire, and it was impossible to establish a proper regimental aid post or to evacuate casualties. Emergency first aid to the wounded who could be reached was the most that was possible prior to the surrender of the few survivors on the beach, at about 8:30 a.m. Both medical officers were taken prisoner. Of the 18 other ranks from No. 11 Field Ambulance which composed this section, only six got back to England, three of them wounded; the rest were either killed or taken prisoner.

At Pourville the South Saskatchewan Regiment landed almost unopposed and pushed on into the village. The few casualties suffered on the beach were removed to the landing craft. The regimental medical officer then led his party to a point some 200 yards from the beach where there was a small grassy plot with high embankments on three sides and a house on the fourth. Here the regimental aid post was established, and casualties were received rapidly from the South Saskatchewan and also from the Queen's Own Cameron Highlanders of Canada. It was decided that all casualties at the post would have to be evacuated to the beach. This proved to be a dangerous and difficult task, for the area to be crossed was subjected to almost continuous mortar and machine-gun fire. But by the time orders were received to close the regimental aid post, the accumulated casualties had been successfully transferred to a place along the seaward base of the sea-wall.

In the meantime the regimental medical officer of the Camerons had established himself in the vicinity of a machine-gun nest and been kept fully occupied there.

Two or three attempts to bring assault landing craft in to remove the wounded had failed, but finally four of these vessels got through the barrage of machine-gun and mortar fire, and evacuation of casualties began at once. Some stretcher bearers made repeated trips, and the majority of casualties suffered by the stretcher bearer section of the South Saskatchewan occurred during this period. As the withdrawal from Pourville became general, casualties mounted rapidly under the heavy fire brought to bear from the commanding positions on either side of the village. Some of those wounded in crossing the exposed beach had to be left where they fell; some were picked up by men behind them. Many were wounded after embarking. The destroyer H.M.S. *Albrighton* collected as many survivors as possible from the small craft in which they had been brought away from Pourville. With wounded filling every available space on the destroyer, there was more than enough work for all medical personnel available.

In the attack on Dieppe itself, the medical officers of the Royal Hamilton Light Infantry and the Essex Scottish got ashore successfully with their units and did very fine work among the wounded under most hazardous conditions, but here too it was impossible to establish proper regimental aid posts. The medical officer of the R.H.L.I. was wounded early in action; both these medical officers were eventually taken prisoner. The medical officer of Les Fusiliers Mont-Royal was killed almost as soon as he landed.

The medical officer of the 14th Canadian Army Tank Regiment was scheduled to land with the second wave of tanks, but was unable to do so. The craft carrying him embarked together with the commander of No. 11 Field Ambulance and an R.C.A.M.C. observer, twice went in to the beach in the face of heavy fire but each time had to withdraw. After the second attempt the casualties on board the craft became so numerous that it required the combined efforts of the three medical officers to deal with them. Later the casualties were transferred to two other crafts.

The sections of No. 11 Field Ambulance that were supposed to land on the main beaches remained afloat throughout the entire action. Embarked on the craft carrying the third and fourth flights of tanks which were never committed to the battle, they remained at a position some two to three miles offshore.

At the main beaches every possible effort was made to get the wounded and the unwounded away once the withdrawal began at 11 o'clock. Casualties were cleared to destroyers as far as possible, but inevitably many had to be retained on the smaller escort vessels and on the ordinary tank landing craft still available. An even distribution of casualties was impossible with the result that some vessels were badly overcrowded.

It is difficult to envisage how in such critical circumstances better arrangements could have been made for the care of casualties cleared from the beaches. One of the conclusions subsequently reached, nevertheless, was that the Senior Medical Officer of the force, Surgeon-Commander W. B. D. Miller, R.N.V.R., should have been on the *Calpe*, the headquarters ship. From his position aboard the reserve headquarters ship, H.M.S. *Fernie*, he was unable always to keep abreast of events.

One way or another, from the whole assault area, over 600 wounded were carried back to England. The coastal craft and the bulk of the landing craft put in to Newhaven. The destroyers and larger escort vessels continued on to Portsmouth, A few "stragglers" appeared at other points.

THE RECEPTION OF CASUALTIES IN ENGLAND

For the reception and distribution of these casualties, the D.D.M.S., 1st Canadian Corps, had drawn up detailed plans well ahead of time. But for reasons of security it was considered inadvisable to initiate actual preparations or even to issue the necessary orders until the last possible moment.

The A.D.M.S., 2nd Canadian Division, was well aware of what was impending and had advance information as to his own responsibilities. But the D.M.S. at Canadian Military Headquarters, the A.Ds.M.S. of the other Canadian divisions, and the commanding officers of the hospitals, casualty clearing stations, and field ambulances concerned, first heard about the operation on the morning of 19 August; the D.M.S. was notified about 5:30, the rest about seven o'clock.

The A.D.M.S., 2nd Canadian Division, was made responsible for the reception and evacuation of casualties disembarked in the Portsmouth area, where the bulk of them was expected. The commanding officer of No. 8 Field Ambulance was delegated similar authority in respect of those landed in the Newhaven-Shoreham area. Two sections of No. 1 Motor Ambulance Convoy were made available to each of these officers for the transport of casualties from the Portsmouth area to No. 15 General Hospital at Bramshott, and from the Newhaven-Shoreham area to No. 1 at Horsham and No. 14 at Horley. To make the necessary number of beds available, these hospitals were to evacuate as many as possible of their existing patients to No. 7 at Marston Green. So far as available space would permit, walking wounded were to be distributed among Nos. 2, 4, and 5 Casualty Clearing Stations at Cranleigh, Dorking, and Lingfield respectively. The A.D.M.S., 1st Canadian Division, was to form a reserve of ambulance cars for the Newhaven-Shoreham area, while the A.D.M.S., 3rd Canadian Division, was to maintain a similar reserve for the Portsmouth area. Casual cases arriving at odd points along the coast were to be evacuated in the normal way by the division holding that portion of the coast.

In the Portsmouth area, No. 10 Field Ambulance opened an advanced dressing station in the vicinity of the "hards" at Stokes Bay, and provided the stretcher bearers necessary to unload the 'hospital' landing craft. One of its medical officers, a small detachment of stretcher bearers, and two ambulance cars proceeded to the Naval Dockyard, Portsmouth. Two other medical officers were sent to a temporary transit depot for unwounded personnel at Stockheath to care for any casualties that might arrive there by mistake. The two sections of No. 1 Motor Ambulance Convoy allotted to this sector, reinforced by 18 ambulance cars from the 2nd Division, assembled at an appropriate rendezvous to the north of Portsmouth. These arrangements were completed by 12:30.

No. 8 Field Ambulance established a main dressing station at Newhaven and an advanced dressing station at Shoreham. One medical officer was provided for the temporary transit depot at Peacehaven. The allotted ambulance cars from No. 1 Motor Ambulance Convoy, plus 20 derived from various field ambulances, were directed to Firlie Park, a few miles north-east of Newhaven. According to the original order, these preparations were to be completed by five o'clock in the afternoon. But during the morning, as reports began to filter in on the progress of events across the Channel, the

time was advanced to two o'clock. The new deadline could not be met, and it was the middle of the afternoon before all was ready for the reception of wounded in the Newhaven-Shoreham area.

Meanwhile, the D.M.S. had done what he could at such short notice to provide vacant hospital beds. No. 15 General Hospital evacuated sufficient cases to NO. 5 at Taplow to leave 400 empty beds. Nos. 1 and 14 cleared a total of 330 cases to No. 7 by means of a special ambulance train, which was substituted at the last moment for the ambulance car convoy that the 5th Armoured Division was to have provided. Arrangements were made for any overflow of casualties to be accommodated at No. 8 General Hospital, Farnborough, No. 6 Casualty Clearing Station, Pinewood, and the various medical centres serving the Canadian Reinforcement Units. A number of beds at No. 1 Neurological Hospital, Basingstoke, were reserved for such cases as might require neurosurgical treatment. By the early afternoon there were, altogether, 1375 beds available in hospitals and medical centres. At each hospital, a surgical team and stretcher parties were standing by.

Inevitably, very little accurate or detailed information was available in the United Kingdom during the day as a basis for medical planning. There was continued uncertainty both as to the number of casualties that might be expected and as to the places where they would be landed. As a result, the medical service was placed at a distinct disadvantage, and several hurried and rather unsatisfactory improvisations had to be made.

The first wounded to reach England—a few naval and commando personnel—arrived at Newhaven about 12:30, that is before there were any military medical installations available to receive them. They were quickly cleared to the Royal Sussex Hospital, Brighton, by ambulances of the Air Raid Precautions (A.R.P.) organization. This incident added to current rumours that large numbers of wounded were about to arrive and led to immediate arrangements being made for the dispatch of a hospital train to Newhaven. By the time the train reached Newhaven at 5:30, no further casualties had appeared, a main dressing station had been opened, and 118 ambulance cars were available, the original allotment of 70 having been reinforced by 48 from the 5th Armoured Division. About six o'clock, casualties began to arrive at Newhaven in considerable numbers. By midnight 81 cases had been loaded on the hospital train, and 151 had been evacuated by ambulance car to hospitals and casualty clearing stations. The hospital train had accommodation for 120 lying and 155 sitting cases, but could not be held much later than midnight. Shortly thereafter, accordingly, it was sent off with only 82 cases, bound for No. 7 General Hospital in accordance with instructions issued by the D.M.S. when informed of its presence at Newhaven. By six a.m. on 20 August a further 43 wounded had been evacuated by ambulance car. At ten o'clock the flow had become a trickle, and an hour later all medical units and personnel in this area were ordered to return

to their permanent stations. No casualties at all had passed through the advanced dressing station at Shoreham. The main dressing station at New-haven had handled approximately 300.

In the Portsmouth area matters went even less according to plan. The first casualties arrived unexpectedly at Southampton about one o'clock, and ambulance cars were dispatched to evacuate them to No. 15 General Hospital. But it was found the patients in question had already been sent to the Royal Victoria Hospital, Netley, where it was decided to leave them.

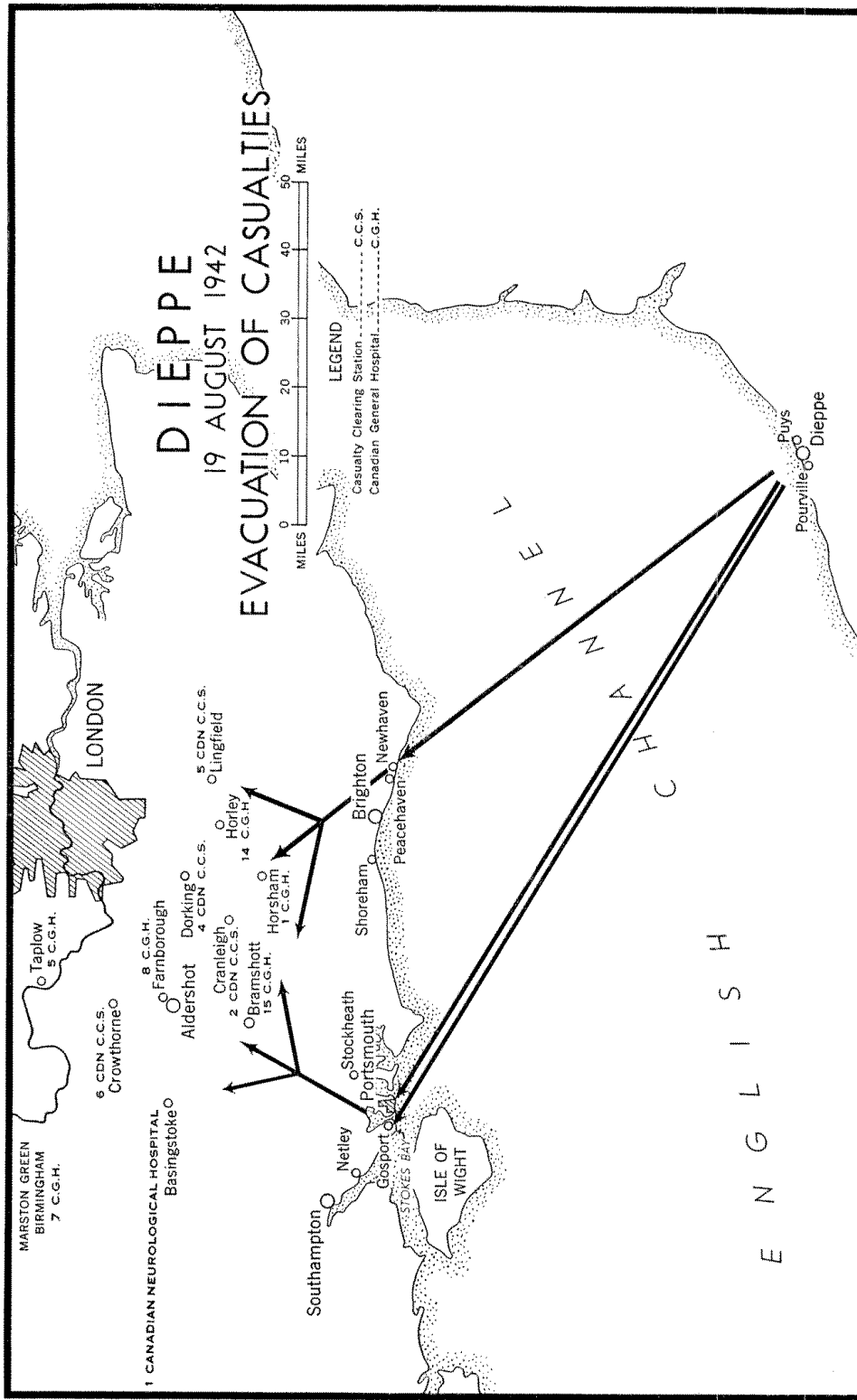
At 6:30 that evening the A.D.M.S., 2nd Canadian Division, who had established a temporary headquarters at Stokes Bay, was notified that casualties were due to arrive shortly at Dolphin Quay, Gosport. A medical officer, two ambulance cars, and several stretcher bearer squads were immediately sent to this point, and in view of current reports that many casualties were to be landed there, reinforcements were ordered to stand by. This situation did not develop further, and the initial detachment proved sufficient.

At nine o'clock, Portsmouth Naval Headquarters informed the A.D.M.S. that no further casualties were to be expected before first light the next morning, and that the telephone operators were being withdrawn from the Stokes Bay exchange. When Canadian objections proved unavailing, two volunteers from No. 10 Field Ambulance took over the exchange for the balance of the night. It was fortunate that they did so. At 10:30 a message came through, confirmed by Headquarters, 1st Canadian Corps, that beginning at midnight 500* casualties were to be landed from destroyers in the Naval Dockyard Portsmouth.

One medical officer, two ambulances, and a few stretcher bearers were left at Stokes Bay. The remainder of the personnel of the advanced dressing station hurriedly packed up and moved the 15 odd miles to the Naval Dockyard. The scene there was one of congestion and utter confusion, for time had been lacking to organize a properly coordinated system of dealing with the situation. The A.D.M.S. managed to get his own organization functioning before the first destroyers berthed. But there were so many kindly and enthusiastic civilians endeavouring to assist, and so many service authorities issuing orders, that it was not possible for him at this stage to establish effective control over the whole evacuation. Nevertheless, approximately 200 of the casualties landed from the destroyers were cleared through Canadian channels; the rest were evacuated by naval ambulances, A.R.P. ambulances, and civilian cars to the Royal Naval Hospital at Haslar (near Gosport) and to various Emergency Medical Service hospitals.

The destroyers having berthed in pairs, much difficulty was experienced in getting some stretcher cases ashore; especially since the decks were crowded with unwounded survivors, who had been ordered to remain on board until

* The real number could not have been much above 300.



all casualties had been landed. A.R.P. ambulances could not take service stretchers, so that casualties being evacuated in these vehicles had to be transferred to A.R.P. stretchers on the dock. Most military personnel proved to be unfamiliar with Neil-Robertson stretchers, which were brought into use by the Navy in an effort to speed up proceedings. But despite the delays and difficulties, and what seemed at times to be insurmountable traffic snarls, all casualties were evacuated from the dockyard by 5:30 on the morning of 20 August. Later in the morning a few casualties were landed at Stokes Bay, but by one o'clock the whole task had been completed.

The wounded had meanwhile been streaming into the hospitals and casualty clearing stations prepared for their reception. Most of them were Canadian, but there was a small sprinkling of British. No. 15 General Hospital received about 230 cases, many of them surgical, and became hard-pressed. Otherwise there was no overcrowding, and this one instance was quickly relieved by transferring 50 cases to No. 8. Surgical teams at the receiving hospitals were reinforced as required, and the situation was well under control at all times. By the morning of 21 August, through adjusting patient populations, sufficient beds were available in the installations involved to take care of casual sick as well as battle casualties.

Among the approximately 600 casualties admitted to Canadian hospitals, the mortality rate was only 2.5 per cent; seven patients were admitted in *extremis*, and eight died after operation. Moreover, 16 per cent of the cases were discharged during the first week and a further 14 per cent at the end of the second week.* The hospital staffs demonstrated a degree of skill and efficiency that was in the best traditions of the medical profession, military or civil, and well merited the praise subsequently bestowed by the G.O.C., 2nd Canadian Division, in a letter to the D.M.S.:

Since the Division returned from Dieppe I have had an opportunity of visiting each of your hospitals in which our wounded lads were being treated. On all sides there was nothing but the highest praise for the kindly care meted out to them by your medical staff and nursing sisters.

It has been a remarkable feat of surgical skill and careful nursing that so many have by now recovered, and others are well on their way to convalescence. . . . †

It should not be overlooked, nor was it overlooked at the time, that much less satisfactory results would have been obtained by surgeons, physicians, and nurses in the hospitals had not medical personnel along the whole chain of evacuation performed their duties in a highly efficient manner in very difficult circumstances. To this the Divisional Commander testified as warmly as he did to the work of the hospital staffs. Writing to his A.D.M.S. a few days after the operations, he said:

* MacFarlane, J. A., "Dieppe in Retrospect" (*The Lancet*, 17 April 1943).

† W.D., D.M.S., C.M.H.Q., October 1942: Appx 2.

The work of the R.C.A.M.C. during the recent combined operations has been under my special notice, in its various phases. All ranks concerned have done a Trojan job both in the actual operation and in the evacuation of wounded on our return. It is my wish that you communicate to all ranks concerned my appreciation and commendation. *

The many Canadian and British wounded who had so unfortunately to be left at Dieppe were evacuated in the same manner as German casualties. Over an hour before the action finally ended 150 Canadians and British had been cleared from the battlefield to a field dressing station, along with 130 Germans. Nearly 350 of our wounded were evacuated with some 175 Germans by the first hospital train, which left the Dieppe area early in the evening of 19 August. A second train, dispatched about midnight, carried another 240 Canadians and British. Both trains were well staffed by German medical personnel. During the morning of 20 August the field dressing station serving the Dieppe area was finally cleared of all but seven German and 16 Canadian casualties, who were so seriously wounded that they could not be moved.

* W.D., A.D.M.S., 2 Cdn Div., August 1942: Appx 16.

THE SICILIAN CAMPAIGN

The British and American Combined Chiefs of Staff decided at the Casablanca Conference in January 1943 to launch a joint attack against Sicily following a successful conclusion to the campaign then being waged in North Africa. During the subsequent planning period it was arranged to substitute the 1st Canadian Infantry Division for the 3rd British Division and the 1st Canadian for the 33rd British Army Tank Brigade as the formations to be drawn directly from the United Kingdom.

PLANS AND PREPARATIONS

The Operational Plan

Agreement as to the method of carrying out "Husky", the code name assigned to the operation, was not easily reached. At the time of the Casablanca Conference seaborne assaults against both the western and the south-eastern portions of the island were envisaged. But this dispersal of effort was not looked upon with favour by the senior commanders concerned, chiefly because the land forces allotted were thought insufficient to guarantee the early capture of all airfields from which the enemy could effectively counter-attack the accompanying naval forces. Two revisions failed to correct what were considered to be the essential weakness of the double-assault plan, and finally it was scrapped altogether in favour of a single concentrated effort by the British Eighth and the United States Seventh Armies against the south-east corner. But it was the early part of May before this was agreed upon, due largely to the preoccupations of the continuing campaign in North Africa.

The Eighth Army's attack was to be on a two-corps front, preceded by airborne landings west of Syracuse. The 13th Corps would strike at the Avola area. To its left the 30th Corps would assault the Pachino Peninsula: the 231st Brigade north and south of Marzamemi; the 51st (Highland) Division to the south and south-east of Pachino; the 1st Canadian Infantry Division at the base of the peninsula on its western side. On the extreme left flank a Special Service Brigade (Nos. 40 and 51 Royal Marine Commandos), under Canadian command, would provide a link with the Seventh Army. To be included in the Eighth Army reserve was the 1st Canadian Army Tank Brigade less one regiment.

The 1st and 2nd Canadian Infantry Brigades were to attack side by side over a sandy stretch of beach extending some five miles along the south-western side of the Pachino peninsula from a point about two miles from its southernmost tip, destroy the coast artillery and beach defences, clear the

high ground overlooking the beaches, and capture the Pachino airfield. The 3rd Infantry Brigade and the 12th Tank Regiment, the core of the divisional reserve, were then to land, preparatory to a general advance inland in conformity with the 51st (Highland) Division on the right. The Special Service Brigade, meantime, was to seize the beaches and hinterland on the immediate left flank.

The allied force was to be maintained over the beaches until such time as ports could be captured and put into operation. For this reason Nos. 3 and 4 Beach Groups, composed mainly of British personnel, were placed under command of the 1st Canadian Infantry Division for the assault phase of the operation. No. 3 was to land with the 1st Brigade on the right to develop a Beach Maintenance Area. A detachment from No. 4 was to accompany the 2nd Brigade ashore to enable the vehicles of that brigade to be passed over its own beaches. The bulk of No. 4 Beach Group was placed in divisional reserve. Its task was to land on either the Canadian or the British sector of the peninsula, whichever should be found more suitable for extension of the Beach Maintenance Area.

Medical Plans

All medical planning was hampered in the beginning by delay in reaching a firm decision as to the operational plan. The problem was further and continuously complicated in the case of the 30th Corps by the physical separation of its component parts. The Corps planning staff was in Cairo from 27 April to 5 June, thereafter in the Sfax-Sousse area of Tunisia. The 231st Infantry Brigade was in the Nile Delta. The 51st (Highland) Division was in North Africa, between Algiers and Tunis. The 1st Canadian Division in the United Kingdom was even more divorced from centralized direction.

The medical headquarters of the Middle East Command, of the Eighth Army, and of the 13th and 30th Corps managed to maintain a reasonably close liaison. When planning in these formations was finally completed, those concerned were satisfied that the medical arrangements for Operation "Husky" were sufficiently comprehensive to meet any eventuality, provided that the necessary details could be imparted to subordinate formations.* In that proviso lay the difficulty facing the 30th Corps. The D.D.M.S. could not well absent himself from Cairo until the details of the Corps plan had been agreed upon. For similar reasons, his A.Ds.M.S. had to remain with their respective formations. Although both divisions sent liaison officers to Corps Headquarters, neither sent a medical representative.* Thus was the basic problem of physical separation aggravated for the medical staffs.

As the 30th Corps medical plan developed, all available information was sent to the medical headquarters of subordinate formations with such

* 11 /Sicily/1 : Report on Operation "Husky" by D.D.M.S., 30th Corps.

advice or instructions as seemed necessary. But some of this was dangerously slow in reaching the two divisions, though sent by air under security arrangements. Much vital information on malaria, thought to have been sent directly and early to the Canadian A.D.M.S. from G.H.Q., Middle East, and from the D.D.M.S., Eighth Army, had not reached its destination by 5 June.* In fact documentary material on a considerable range of medical subjects arrived in Canadian hands too late for effective action to be taken.†

It was fortunate that the D.D.M.S. was able to pay a liaison visit to the United Kingdom early in June, even though at that date it was difficult to effect changes in Canadian plans. He spent 12 days with Headquarters, 1st Canadian Infantry Division, interspersed with conferences elsewhere. No record appears to have been kept of the discussions that took place, but there is no doubt that they were of considerable value. For one thing, the D.D.M.S. discovered that although arrangements had been made for every Canadian officer and soldier to receive one mepacrine tablet daily at sea for six days prior to D Day, as an essential anti-malarial precaution, no adequate provision had been made for continuing this routine ashore; "their first follow-up supply of mepacrine being due to arrive on D plus 3, and to be unloaded an indefinite number of days after that".‡

This particular oversight was speedily remedied, and the risk of casualties from malaria to that extent lessened. But the incident clearly reflects the difficulties under which the Canadian medical planners had to labour, for one of the thorniest problems confronting them was that of making adequate provision for the protection of the troops against malaria.

Information trickled in slowly and seemed incomplete. Time for planning was brief, and there was no time for extensive training of special personnel. Equipment was provided so late that no one had time to see it, let alone become familiar with it. Middle East was most helpful, but not knowing the general state of indecision and ignorance of the subject could, at first, help only with suggestions. The specially trained malaria officer, so willingly provided and flown home, by some mistake did not reach the division for 10 days after arrival in England. He was able only to carry out training instructions for about three days before embarkation, and could not reach all medical officers. . . .§

Every unit in the Division was directed to appoint an anti-malaria officer who was to familiarize himself with the subject. Three combatant officers and three non-commissioned officers were given a special course of training in malaria at the British Army School of Hygiene. Eight medical officers, who had previously taken a course at the School of Tropical Medicine were given a further few days instruction devoted entirely to malaria. Rather late in the day, three anti-malaria control units were formed. But it was to require

* *Ibid.*

† Canadian Planning Staff (C.P.S.) Files, 2500/3. This series is held by the Historical Section (G.S.), A.H.Q.

‡ Report by D.D.M.S., 30th Corps, *op cit.*

§ 11 [Sicily /1 : Report on employment of Medical Units in Sicilian campaign by A.D.M.S., 1 Cdn Inf. Div, 25 August 1943.

some painful practical experience with the disease before all ranks became reasonably conversant with the methods and the need for protection and control.

Planning was made no easier by late changes in the medical order of battle. When Canadians took over from their opposite numbers of the 3rd British Division's planning staff on 24 April, it had been decided tentatively that the medical component of the force to be dispatched from the United Kingdom should consist not only of the required divisional units, but also of one 600-bed general hospital, one casualty clearing station, one corps field dressing station, two field surgical units, and one field transfusion unit. Nos. 4, 5, and 9 Field Ambulances, Nos. 1 and 2 Field Dressing Stations, and No. 2 Field Hygiene Section automatically replaced the medical units of the 3rd British Division. Despite some doubt about the need for it, No. 2 Light Field Ambulance was detailed to accompany the 1st Army Tank Brigade. No. 5 General Hospital (600 beds) was substituted for the British general hospital earmarked for the operation. Some consideration was given to replacing also No. 4 British Casualty Clearing Station, No. 3 British Field Dressing Station, Nos. 35 and 36 British Field Surgical Units, and No. 35 British Field Transfusion Unit. But the final decision was against this. In the latter half of May, however, as the result of a liaison visit to the Middle East and North Africa by the Deputy Adjutant General, Canadian Military Headquarters, Brigadier A. W. Beament, five Canadian medical units were added to the order of battle.

Brigadier Beament, accompanied by an officer who was to remain in North Africa as Canadian representative at the most appropriate headquarters, left the United Kingdom at the end of April. At Cairo and Algiers they met with senior British officers to discuss the broader aspects of the medical arrangements for Operation "Husky" as they affected Canadian participation.

The original plan for the evacuation of casualties from Sicily had been to use Malta as a general casualty clearing centre. To hospitals especially set up there all wounded were to have been directed in the first instance for sorting and for whatever surgery might be necessary immediately. From Malta the lines of evacuation would have run southward to Tripoli and westward to the Sfax-Sousse area. Further evacuation was to have been from Tripoli eastward to the Nile Delta and from Sfax-Sousse further westward into North Africa. "This plan would have suited Canadian requirements admirably, since Canadian casualties could have been sorted out at Malta and directed westward as soon as they were capable of being moved".* But for various reasons this plan had been abandoned by the time Brigadier Beament reached the Middle East.

* McNaughton Files, P.A. 1-14-1, vol 1: D.A.G., C.M.H.Q. to Senior Combatant Officer, Cdn Army Overseas, 21 May 1943-Report on trip to the Middle East and North Africa 29 April - 14 May 1943. This series of files is held by the Historical Section (G.S.), A.H.Q.

Under the new and final plan, casualties were to be evacuated from Sicily directly to Tripoli or to the Sfax-Sousse area. A considerable number of Canadians could therefore be expected to arrive at Tripoli, from where they would normally be routed to hospitals in the Middle East. Brigadier Beament considered it important that no substantial number of Canadians be moved into the Middle East, as this would entail the establishment of Canadian personnel depots in that area. He therefore "obtained agreement from all concerned"* that Canadian casualties reaching the hospital area at Tripoli would be held there until arrangements could be made for their movement westward.

Where such casualties were to be sent was of course the next question. No. 5 General Hospital was to open in Sicily along with five British hospitals. British hospital beds throughout the theatre totalled less than 6 per cent of the troops being served, and lack of resources prevented any increase. To employ the Canadian unit in North Africa, without decreasing the agreed scale of hospital provision in Sicily, would necessitate the dispatch of another British general hospital. Such a solution appeared highly undesirable. But if No. 5 General Hospital were to proceed to Sicily as planned, it followed that there would be no Canadian hospital on the mainland, a situation that seemed to Brigadier Beament equally undesirable because of the possible effects on morale and on public opinion in Canada. Though fully appreciating that no practical Canadian contribution to the medical resources of the theatre could possibly ensure that every Canadian casualty would be treated in a Canadian hospital, he concluded that at least one 1200-bed Canadian hospital should be provided for service in North Africa. In the ordinary course of events this would ultimately collect a fair percentage of Canadian casualties. There was the additional consideration that Canadian hospitals had had a long period of comparative inaction: "the placing of a hospital on the mainland would be desirable from the point of view of giving our surgeons an opportunity of gaining experience in war surgery".*

The British authorities had made it clear that any additional Canadian medical contribution to Operation "Husky" would be more than welcomed. In view of this, and of "The high probability of peak operative loads",* Brigadier Beament came to the further conclusion that from Canadian resources another two field surgical units and one field transfusion unit should be provided. A Canadian convalescent depot also appeared to him a necessity. While in the Middle East he inclined to the view that a Canadian wing at a British depot would suffice. But on examining the problem further in North Africa, he became convinced that a separate one was required, chiefly because of the importance of this type of unit in the personnel maintenance system.

A British suggestion that the Canadian hospital ship *Lady Nelson* be placed on the run between North Africa and the United Kingdom was

* *Ibid.*

completely rejected on the ground that she had to be kept on the North Atlantic run. There were three British hospital ships operating at this period between North Africa and the United Kingdom. A fourth, the French hospital ship *Canada*, then at Dakar, was in the process of being taken over. To the further suggestion that "it would not be unfair for *Canada* to staff or at least contribute to the staffing of this ship",* in view of the fact that Canadian casualties would have to be evacuated to the United Kingdom by sea, Brigadier Beament replied that if difficulty was encountered in staffing the *Canada* from British resources, the War Office should be requested to take the matter up with the Canadian authorities in the United Kingdom. Nothing further appears to have been heard about staffing the *Canada*, but it was finally agreed that the *Lady Nelson* operating as a Canadian hospital ship on the Atlantic run between Canada and the United Kingdom would, on her eastbound trip, call at North Africa and evacuate casualties both British and Canadian to England.

Investigation of the possible need for a Canadian advanced or base depot medical stores also led to a conclusion in the negative. All medical units were to carry supplies sufficient for one month, and the casualty clearing station was to be responsible for holding an extra 40 tons of medical stores. This appeared to be ample provision, especially since all Canadian medical supplies were to be obtained from British sources once normal lines of communication were established.

Upon Brigadier Beament's return to the United Kingdom about the middle of May, it was promptly agreed that in addition to the Canadian medical units already allotted No. 15 General Hospital (1200 beds), No. 1 Convalescent Depot, Nos. 1 and 2 Field Surgical Units, and No. 1 Field Transfusion Unit should be made available for Operation "Husky". It was further decided that personnel from the dental company serving the 1st Infantry Division would be attached to field medical units in sufficient numbers to place them on the same footing in this respect as the British, in whose war establishments a dental element, contrary to Canadian practice, was permanently incorporated.†

The employment of these additional units was no problem. It was a question of finding shipping space for their personnel, vehicles, and equipment. Colonel Playfair, A.D.M.S., under whose control the field transfusion and field surgical units were to function, had been faced from the first with the need to balance the desirability of having his units in all respects at full strength against the availability of shipping space, but had managed to effect a reasonably satisfactory compromise. Though on a reduced scale of vehicles, medical units were to take almost their full number of personnel; in compensation for the vehicles that could not be included, considerable

* *Ibid.*

† 3/Sicily/1/2: Memorandum of meeting held at HQ First Canadian Army on 16 May 1943, dated 20 May 1943. See also, H.S. 010. (D2) Op Orders: 1 Cdn Div Operation Order No. 1, 7 June 1943, Appx "N".

latitude had been allowed in obtaining space for unaccompanied medical stores. To fit in three extra units, however small, was no easy task. In the end, the heavy load-carrying vehicles of each Canadian field surgical unit had to be left behind.* No. 15 General Hospital and No. 1 Convalescent Depot, which, like No. 5 General Hospital, were to be employed under British control apart from the Division, presented a similar problem, but to a lesser degree. They did not form part of the assault force properly speaking, and separate arrangements were made for their departure. These were easier to re-adjust than those for a force that had to be loaded tactically, ready for battle.

Every addition to the force also increased the administrative work connected with preparing units for battle. Much of the equipment required by the assault force was to be carried packed in unit vehicles, and great care had to be exercised that these were not overloaded and that the right equipment was placed on them. What could not be carried in vehicles was to travel unaccompanied in the cargo ships, and had to be done up in easily handled packages. Complete records of the whereabouts of all equipment had to be prepared, so that in the event of ships being sunk no time would be lost in demanding replacements for the equipment lost with them. On the more purely medical side, vaccination and inoculations had to be brought up to date in all units. Extra stocks of stretchers and blankets had to be acquired. There were large red crosses to be painted on the top, back, and sides of every ambulance car. First aid kits for vehicles, two pairs of spectacles for those who required them, the proficiency of regimental stretcher bearers in first aid—these and other minor administrative details were also of concern to the R.C.A.M.C.

A fairly firm Canadian medical plan for the operation was nevertheless evolved before the end of May.† The resulting operation orders laid down in precise detail what each of the 14 Canadian and British medical units available to the A.D.M.S. was to do during the assault phase.‡

The estimated number of casualties that would require evacuation from the Canadian sector was 3200 from D Day to D plus 6, 1500 from D plus 7 to D plus 14, and 875 weekly thereafter.§ The degree of opposition to be expected was highly uncertain. Should Italian troops put up a stiff resistance in defence of their homeland, as there was every possibility they might, heavy casualties would result. The only course open was to plan for the worst possible contingency.

* Report by A.D.M.S., 1 Cdn Inf Div, *op cit*.

† H.S. 232C1.086 @2) Op "Husky": 1 Cdn Inf Div Maintenance Project, 21 May 1943, Section 16, amended to 15 June 1943.

‡ W.D., A.D.M.S. 1 Cdn Inf Div, vol 43,25 April - 1 June 1943, various appendices. The fourteen units were: Nos. 4, 5,9 Cdn Fd Ambs, Nos. 1 and 2 Cdn F.D.Ss., No. 2 Cdn Fd Hyg Sec, No. 4 Br C.C.S., No. 3 Br F.D.S., Nos. 1 and 2 Cdn F.S.U.s., No. 1 Cdn F.T.U., Nos. 35 and 36 Br F.S.U.s., No. 35 Br F.T.U.

§ 1 Cdn Inf Div Maintenance Project, *op cit*.

Medical policy as laid down for the whole Eighth Army prescribed that until such time as a port was secured and a general hospital landed, all casualties were to be evacuated from Sicily at the earliest opportunity, except trivial cases likely to recover in seven days and those too severely wounded to be moved. The Navy as usual would be responsible for looking after all casualties afloat, the Army for those occurring ashore. Evacuation from shore to ship was likewise to be a naval responsibility, though army medical personnel were to be provided for the craft used as ferries. But in recognition of the harsh realities of war, it was expressly stipulated that "the evacuation of wounded must not be allowed to interfere with the landing of assault troops, vehicles, and reinforcements."*

Regimental medical officers were to land with their battalion headquarters, regimental stretcher bearers with their respective companies. Field ambulances were to be under brigade command, one with each of the assault brigades, the third with the reserve brigade. One field ambulance section would land immediately behind each battalion; unit headquarters and the remaining company with brigade headquarters. The two field ambulances with the assault brigades were each to establish one or more beach dressing stations and, further inland an advanced dressing station. One divisional and the corps field dressing station, accompanied by two field surgical units and one field transfusion unit, were to land early on D Day with Nos. 3 and 4 Beach Maintenance Groups to open two advanced surgical centres in the Beach Maintenance Area. The remaining medical units, held in reserve, were to be landed by the end of D plus three. On that date the casualty clearing station would open, reinforced if necessary by the reserve field surgical and field transfusion units.

Casualties among personnel in landing craft during the early stages of the assault, before medical facilities were fully established ashore, were if possible to be left aboard and taken back to one or other of four parent ships especially designated to receive them; otherwise they were to be taken ashore to a beach dressing station. Late on D Day, or early on D plus one, three hospital carriers† were to arrive off the Canadian beaches. Evacuation to them would be through the maintenance beach at first, but as soon as circumstances permitted a medical embarkation point was to be established in a separate area. Water ambulances from the carriers, and various other types of suitable landing craft earmarked for the purpose, were to provide the necessary ferry service from shore to ship.

Training

While Canadian plans for "Husky" were being evolved, the troops concerned were given a final period of intensive training in Scotland, with

* *Ibid.*

† A hospital carrier was a small vessel of the cross-channel steamer type, temporarily fitted for carrying casualties. It was particularly suited to amphibious operations, since it carried several small landing craft for use as water ambulances.

the emphasis on combined operations. Earlier in the year the three brigade groups of the 1st Infantry Division, including field ambulances, had received their basic combined operations training, but it was considered that some advanced training in this aspect of warfare was required to fit them for their forthcoming operational role. Moreover, some of the divisional troops, among them Nos. 1 and 2 Field Dressing Stations, had as yet received no combined operations training.

Between 30 April and 26 May each brigade group spent approximately one week at the Combined Operations Training Centre, Inveraray. Field ambulance personnel concentrated on such things as the loading of stretcher cases on landing craft, the landing and employment of stretcher bearer sections in support of infantry battalions, and the carrying of casualties over long distances and hilly country. The brigade exercise that concluded the week's training gave each field ambulance an opportunity to test its arrangements for handling casualties during an assault landing on enemy-held beaches. Exercise "Wetshod", carried out on 22 May by the 1st and 2nd Brigades on the Ayrshire coast, was of even more value in this respect. No. 9 Field Ambulance, though not included in this particular exercise, had the 'pleasure' of participating in the special mountain training afforded the 3rd Brigade at Crieff.

Nos. 1 and 2 Field Dressing Stations took part in the training programme arranged for Nos. 3 and 4 Beach Groups at the Combined Operations Training Centre, Gailes, Scotland; Nos. 1 and 2 Field Surgical Units were placed on the order of battle too late to participate. The training included practice landings from assault craft, a demonstration of operating-room technique by one of the field surgical units, lectures on combined operations, the packing of unit equipment on assault scales, and, for drivers, a course in water-proofing vehicles. The methods of setting up an advanced surgical centre and a beach dressing station, using full tentage and equipment, were also studied. The culmination was a small exercise to rehearse the roles of field dressing stations and field surgical units in the type of operation in prospect.

Numerous personnel from Canadian medical units also attended the three basic training refresher courses provided at the Combined Operations Training Centre, Rothesay. The chief object of these was to provide practical experience in water-proofing vehicles and driving them on and off landing craft.

No. 2 Light Field Ambulance, as part of the 1st Army Tank Brigade whose role was that of a reserve formation under the direct command of the Eighth Army, required no combined operations training on this occasion. It proceeded to Scotland with the rest of the brigade early in May, and settled down at Dumfries for a period of intensive but more or less routine training. Route marches and general hardening exercises bulked large in the

programme. Hence the attention devoted to familiarizing all ranks with the various means of crossing rivers and to the mundane task of digging slit trenches served a double purpose.

Nos. 5 and 15 General Hospitals were unable to carry out any great amount of the type of training required to fit them for the field after such a long period in a static role. The installations that they were operating, Taplow and Bramshott respectively, had to be closed down and turned over to small rear parties as the first step in their preparations. This was a problem in itself, and took a good deal of time. The bulk of their field ordnance and medical equipment had to be assembled and shipped without them ever seeing it, and it proved impossible to draw duplicate sets purely for training purposes. Practice even in the erection of hospital tents was made possible only by borrowing canvas from various casualty clearing stations. No. 5 was warned for overseas duty on 4 May, and by the 21st was concentrated in a tented camp at Aldershot, except for its nursing sisters who were forbidden to live under canvas and had to travel back and forth from Taplow. No. 15 was not informed of its new commitment until 24 May, and it never left Bramshott until its departure for the port of embarkation on 28 June. Both units did as much training as possible, but the time available was short and the facilities inadequate. Neither had an opportunity of functioning under canvas with only field equipment available.*

The Convoys

For most of the units destined for Operation "Husky", training virtually ceased early in June because of the deadlines laid down for the loading of the ships that were to carry them to Sicily. Provision had been made for a fast and a slow assault convoy and for two to follow. The fast assault convoy, in which most of the troops were to sail, was not to leave until 28 June. The slow one, comprising vessels carrying the bulk of the transport and equipment required for the initial landings, together with a small number of troops, was to sail earlier, one group on 19 June, the rest on the 24th. The slower and larger of the follow-up convoys was to leave on 25 June, the faster one of ten ships on 1 July; together, in addition to the balance of the expedition's transport and equipment, they were to carry the 1st Army Tank Brigade less one regiment, the two general hospitals and the convalescent depot, a base reinforcement depot, and various divisional units and parts of units not required during the actual assault. This supporting force was to arrive off Sicily on D plus three, the portions of it destined for North Africa having been detached en route.

Beginning on 1 June, transport, stores, and equipment were dispatched in their proper order to the various ports of embarkation. Between 13 and 16

* W.Ds., 5 and 15 C.G.Hs., May - June 1943. I/Hospital/1/2: D.M.S. to D.A.G. C.M.H.Q., 12 April 1944.

June the assault elements of the 1st Division, including the medical units that were to land with them and the necessary complement of beach group personnel, bade farewell to the Scottish training camps, entrained for Gourock, and there joined the ships awaiting them at anchor in the Clyde. At the appointed times and places the remainder of the force was similarly embarked.

The 750 Canadian and 110 British medical personnel from 12 different units were distributed among the ships of the fast assault convoy* in accordance with their operational tasks and the order in which they were to disembark on the Sicilian beaches. The remaining two medical units available to the A.D.M.S., No. 2 Canadian Field Dressing Station and No. 4 British Casualty Clearing Station, were not represented in the fast assault convoy. These, together with the few personnel from the other units who were not required during the assault phase, were included in that portion of the follow-up convoys scheduled to reach Sicily on D plus three. In all, 13 R.C.A.M.C. units with a combined strength of 305 officers and 1484 other ranks embarked for Operation "Husky".†

For the ships of the fast assault convoy no special medical arrangements were necessary. They were passenger liners converted to troop carriers, and each contained a ship's hospital. With medical personnel included among the troops on board, there was ample provision against any emergency that might develop. The same held true of personnel ships in the other convoys. But to such cargo vessels as carried any considerable body of troops, chiefly those with vehicles aboard, medical personnel had to be especially detailed. Thus 13 medical officers and 48 medical orderlies were distributed among 17 ships of the slow assault convoy, and 26 medical orderlies were allotted to 13 ships of the follow-up convoys. These were to rejoin their own units upon reaching Sicily.

From 19 June onwards, one by one, the various convoys slipped quietly out to sea. But to the assault troops lying embarked in the Clyde the days from 16 to 28 June seemed endless, the more so since the weather intervened to force a postponement and finally the cancellation of the divisional exercise planned as a final rehearsal for the assault landing in Sicily. Nevertheless, when finally the transports moved slowly down the river and out into the open sea, there were probably few whose feelings of anticipation were not tinged with regret as the friendly shores of the Island Kingdom quickly receded in the gathering darkness. Ahead lay adventure and, for most, the unknown; behind, a country in which many pleasant hours had been spent, and which to many had come to seem almost like home.

The voyage was relatively uneventful so far as the fast assault convoy was concerned. On Dominion Day the troops were finally informed of their

* H.S. 010. (D2): 1 Cdn Div Operation Order No. 1, 7 June 1943, Appxs "E", "F", "G".

† Historical Officer Report No. 126: *Canadian Operations in Sicily, July – August 1943*, Part I, "The Preliminaries of Operation 'Husky'", Appx "H". This is held by the Historical Section (G.S.), A.H.Q.

destination. Thereafter much time was spent in ensuring that everyone from the highest to the lowest rank was thoroughly briefed on the forthcoming operation. The normal routine of life aboard a troopship (boat drill, meals; sleep, fatigues, inspections), coupled with physical training, deck games and lectures, fully occupied the remaining time. Throughout, great stress was laid on the necessity of keeping the troops in the best possible physical condition.

A considerable portion of the time available for lectures was devoted to a course of instruction by medical officers on the prevention of tropical diseases likely to be encountered in Sicily, particularly malaria. Aside entirely from the difficulties already enumerated, general training in these subjects had not been permitted until late in the planning period for security reasons. In a medical directive to officers commanding troops, the A.D.M.S. stated:

Malaria is largely a preventable disease. Strict anti-malaria discipline is necessary for the success of all anti-malaria measures. The fate of a campaign in a malarious area may depend on the efficiency with which these measures are carried out. It is the duty of the Medical Services to ensure that all ranks receive the necessary training and instruction in malaria prevention.

During the course of the voyage every effort must be made to make all ranks 'Malaria Minded'. *

To the importance of this directive, and of the suggested course of lectures included in it, added force was given by a personal letter from General B.L. Montgomery to all unit commanders stressing the hazard of tropical diseases and the responsibility of the individual in combating them.

The slow assault convoy was the only one seriously to encounter the enemy. On the night of 4-5 July two of its ships, the *St. Essylt* and the *City of Venice*, were torpedoed off the North African coast. The following day a third ship, the *Devis*, was similarly sunk. Aboard the latter, through a mistake in brigade planning,† were 15 of the 18 vehicles allowed No. 9 Field Ambulance, all loaded with stores and equipment. Two vehicles from No. 5 Field Ambulance, together with the equipment they carried, were sunk with the *St. Essylt*. Some nine tons of miscellaneous unaccompanied medical stores went down with the *City of Venice*. Casualties among R.C.A.M.C. personnel, on the other hand, were fortunately few. The three medical officers attached to these ships were all rescued. Of the 22 other ranks accompanying the medical vehicles or acting as medical orderlies, four were killed, and four wounded; all were No. 9 Field Ambulance personnel aboard the *Devis*. ‡

* H.S. 232C1.016 (D3): A.D.M.S. 1 Cdn Div to Os.C. Troops, All Ships, 18 June 1943.

† Report by the A.D.M.S., 1 Cdn Inf Div, *op cit*.

‡ H.A.C. 1915-75/58 (D.H.S. Office Copy): Director War Service Records to Director Historical Section, 28 April 1949.

COURSE OF THE CAMPAIGN**The Assault and Initial Penetration**

On the morning of 9 July the fast assault convoy joined forces off the southern coast of Malta with that part of the slow one required for the initial attack, and then headed northward towards Sicilian waters on a course designed to bring it to the position some six or seven miles offshore whence the troops would set out in landing craft for their allotted beaches. As the day wore on a stiff gale blew up and for a time threatened to make a seaborne landing impossible, but fortunately it abated somewhat by nightfall. Although high seas were still running when the Canadian convoy dropped anchor at the "release position" shortly after midnight, the leading waves of assault craft were got away mostly on schedule and with less difficulty than had been anticipated.

The adverse weather conditions had largely a favourable influence on the initial landings, since they threw the Italian coastal garrisons momentarily off guard. Even though the assault elements of the 1st Infantry Brigade were late in getting ashore and a battalion of the 2nd Brigade landed in the wrong place, the first Canadian objectives were all captured before seven a.m., enabling the reserve battalions of the two leading brigades to begin landing. Shortly thereafter the divisional reserve was ordered to follow suit, and by 11 o'clock the 3rd Brigade was on its way ashore in the wake of the 12th Tank Regiment. By six p.m. the 1st Brigade on the right was firmly in possession of the Pachino airfield and the area immediately to the north and west. Equal success crowned the efforts of the 2nd Brigade on the left. Only in the area assaulted by the Special Service Brigade did the enemy react strongly. There a Blackshirt unit put in a spirited counter-attack that threatened to penetrate to the beaches. But a heavy concentration of Canadian mortar fire quickly turned the scales. The day's work closed, under the cover of darkness, with a general advance of some four miles towards Ispica.

The assault sections of Nos. 4 and 5 Field Ambulances, under command of the 1st and 2nd Brigades respectively, landed immediately in rear of the battalions to which they were allotted, those with the leading ones about six a.m. All were ashore by approximately 7:30, and with few casualties to deal with on the beaches were moving inland behind the advancing infantry. An hour or so later, the headquarters and reserve companies of these field ambulances had landed, and beach dressing stations had been established a short distance from the shoreline in each brigade sector. As previously arranged, No. 5 promptly made contact with the Special Service Brigade and dispatched a section to evacuate its casualties. About noon two advanced dressing stations were opened, one by No. 4 a little over a mile from "Roger" beach in the direction of Pachino, and the other by No. 5 in a farm house

about one-quarter of a mile from "Sugar" beach.* The latter was eventually found not to be required and was therefore closed, leaving such casualties as arrived back in this sector to be handled by the beach dressing station.

No. 9 Field Ambulance disembarked with the 3rd Brigade and proceeded directly to the allotted concentration area, where it was destined to remain in reserve for several days due to its transport losses at sea. No. 1 Canadian Field Dressing Station, No. 35 British Field Surgical Unit, and No. 35 British Field Transfusion Unit all landed about noon. Shortly thereafter they opened an advanced surgical centre in a farm building about half a mile from the beach within the 1st Brigade's sector where they were joined the next day by No. 2 Field Surgical Unit.

Canadian casualties on D Day, as finally determined, were seven killed and 25 wounded. The Special Service Brigade, more heavily engaged, lost nine killed and 32 wounded.† Though most of these occurred inland, wounded began to arrive back at the beach dressing stations early in the afternoon. All received there during the day, including a number of Italians, were that evening evacuated to the hospital carrier *St. David*.

A rapid Canadian advance between 11 and 13 July resulted in the occupation of Ispica, Modica, and Ragusa by the 2nd Bsigade and a penetration as far as Giarratana by the 1st. During this three-day period, as indeed throughout the campaign, one company of each field ambulance remained in the forward area to provide the infantry battalions with close medical support. Behind them, the headquarters of two field ambulances leap-frogged forward under control of the A.D.M.S. to open advanced dressing stations : No. 4 at Bompalazzo near Burgio on the 11th, No. 5 at Ispica on the 12th, No. 4 about a mile south of Modica on the 13th. Further to the rear, No. 1 Field Dressing Station continued throughout D Day to form the nucleus of an advanced surgical centre in the farm building just off the beach. On the following day a more suitable site was found for it at Maucini, and there it was joined by No. 1 Field Surgical Unit and No. 1 Field Transfusion Unit. It moved forward to Bompalazzo on the 13th, being relieved in Maucini by No. 3 British Field Dressing Station which, with attached British surgical and transfusion units, operated an advanced surgical centre.

At Bompalazzo, in the buildings vacated by No. 4 Field Ambulance, there was established a Canadian medical centre comprising No. 1 Field Dressing Station, Nos. 1 and 2 Field Surgical Units, No. 1 Field Transfusion Unit, and No. 9 Field Ambulance. The latter, largely immobilized for lack of transport and equipment, looked after the admission, documentation, and further evacuation of patients. The field dressing station did triage and

* "Roger" and "Sugar" were the code-names assigned to respective beaches over which the 1st and 2nd Brigades carried out their attacks.

† H.S. 113.065 (D8): Cdn Casualties, Sicily, 10 July - 25 September 1943, compiled from figures provided by War Service Records, D.V.A., 21 April 1949. This is also the source of all subsequent statistics relating to Canadian battle casualties in Sicily.

resuscitation in conjunction with the field transfusion unit. Since the equipment of the two field surgical units had not yet been landed, they were able to function only with borrowed instruments. All but the most urgent surgical cases were therefore sent on to No. 3 British Field Dressing Station, whose attached surgical units were better equipped. By the evening of 13th July the Canadian line of evacuation thus ran back through Modica and Ispica to the medical centre at Bompalazzo, thence to No. 3 British Field Dressing Station at Maucini, and finally to the beach dressing stations serving the casualty embarkation point.

On 13 July the Division had been ordered to rest a day and a half in the Giarratana area. Hence there was little change in medical dispositions during the 14th. No. 4 British Casualty Clearing Station had landed as scheduled and was concentrated in the vicinity of the medical centre; so also was No. 2 Canadian Field Dressing Station. But in view of the small flow of casualties and of the further advance in prospect neither was opened. Instead, preliminary arrangements were made for siting the casualty clearing station at Modica. For the time being, casualties from the 1st Canadian Infantry Division and attached troops would continue to be evacuated over the beaches to a hospital carrier.

Up to the end of 14 July battle casualties remained extremely light, the Canadian total for the five days being 25 killed and 97 wounded.* An indeterminable number of British, American, and Italian casualties also passed through Canadian medical channels, but even including the 32 commando personnel wounded on D Day, it could not have been large. The beach dressing station on "Roger" beach evacuated 19 Canadian, 25 allied, and 18 Italian wounded up to six p.m. on 11 July. The next day at Bompalazzo, No. 4 Canadian Field Ambulance handled 34 patients : 29 Canadian, 3 British, 2 American. The total number of battle casualties received during the first five days probably did not exceed 200. For the same period the sick rate was negligible.

The Advance to Valguarnera

The Canadian advance was resumed on the night of 14-15 July, directed on Vizzini, Caltagirone, and Enna. The leading troops passed through Vizzini during the morning of the 15th, and after a brisk encounter with German troops at Grammichele entered Caltagirone unopposed early on the 16th. The Germans made another stand in the hills to the south of Piazza Armerina, but by 17 July this place too was in Canadian hands. Enemy resistance was steadily stiffening, and that afternoon the 3rd Brigade, now leading the advance, ran into a formidable position about five miles beyond Piazza Armerina covering the junction of the roads to Valguarnera and Enna. Bitter and somewhat confused fighting followed, but by the end of the

* *Ibid.*

18th the Germans had been forced back and Valguarnera occupied. By this time it had been decided that the 1st Division would be directed northwards towards Leonforte and Assoro and leave Enna to be taken by the Americans.

The speed of the advance from Giarratana to Valguarnera, a distance as the crow flies of some 40 miles, but considerably longer over the tortuous Sicilian roads, placed a strain on the medical service. At the outset most medical units were still at Bompalazzo, approximately 25 miles behind the starting point. No. 9 Canadian Field Ambulance and No. 4 British Casualty Clearing Station could be moved forward only by borrowing transport from other units. There was also the problem of 40 tons of unaccompanied medical stores. These were to have been dumped in the vicinity of the casualty clearing station to serve as an *ad hoc* advanced depot medical stores staffed by field ambulance personnel. Instead, they were left on the beach with no one to look after them, presumably because the casualty clearing station did not open in the beach area as planned. There were, in short, too many tasks for the medical transport available, especially since heavy ambulance cars began to reach units from the follow-up convoys only on 15 July. An effective chain of evacuation was maintained behind the advancing troops, while at the same time the casualty clearing station and most of the medical stores were transferred to Modica. But the extent to which personnel and vehicles were taxed in the process led the A.D.M.S. to suggest later that "the moving of a casualty clearing station or (the) establishing of an advanced depot medical stores should never be anything but a Corps responsibility".*

When the leading troops set out in the direction of Vizzini, No. 5 Field Ambulance had already been ordered forward from Ispica to Monterosso Almo. There, on the morning of 15 July, an advanced dressing station was established in a large municipal building. No. 1 Field Dressing Station and No. 1 Field Surgical Unit arrived late that afternoon and opened an advanced surgical centre in a building opposite. But this arrangement did not long suffice to keep pace with the advance. That night, accordingly, No. 4 Field Ambulance, still located south of Modica, was ordered to have an advanced dressing station open in Grammichele by first light. Many of its vehicles had been engaged throughout the day in moving the casualty clearing station and medical stores, and it had previously been instructed to retain all casualties save urgent surgical cases, with a view to transferring them to the casualty clearing station as soon as it opened. Nevertheless, by leaving the reserve company behind to look after patients on hand, the unit successfully executed its new orders.

Those wounded on the 15th during the fighting south of Piazza Armerina were evacuated to the advanced dressing station thus established in Grammichele. Thence, by means of ambulance cars from a British motor ambulance convoy, which began to operate in the Canadian sector that morning, they were cleared to Syracuse through two British main dressing stations

* Report by A.D.M.S., 1 Cdn Inf Div, *op cit.*

near Vizzini,* at one of which a surgical team was available. The A.D.M.S., in consultation with the D.D.M.S., 30th Corps, had decided not to open No. 4 British Casualty Clearing Station in Modica, but instead, to move all medical units south of Monterosso Almo to an area midway between Vizzini and Grammichele and evacuate to Syracuse. Except for No. 4 Field Ambulance, all Canadian medical units thus spent most of 16 July and the night following in moving forward, four of them from as far back as Bompalazzo.

All patients held south of Vizzini had first to be cleared to No. 3 British Field Dressing Station in the beach area. To complicate matters further, vehicles had to be sent back from No. 5 Field Ambulance to move No. 9. By the time the units from Bompalazzo finally reached the area north-west of Vizzini early on the 17th, Piazza Armerina had been captured, and the advance was being pressed beyond it. No. 4 Field Ambulance therefore remained open at Grammichele while the general forward movement of the medical service continued. The late afternoon found No. 5 Field Ambulance open about three miles south of Piazza Armerina, No. 1 Field Dressing Station, with No. 1 Field Surgical Unit attached, functioning as an advanced surgical centre at the main road junction two miles west of San Michele, and the remaining units concentrated in the same general area as a reserve.

About noon on 18 July, the day of the most severe fighting to date, No. 5 Field Ambulance shifted its advanced dressing station to a point less than three miles from the bitterly disputed road junction to the south-west of Valguarnera. Simultaneously No. 2 Field Dressing Station, with No. 2 Field Surgical Unit and No. 1 Field Transfusion Unit attached, opened an advanced surgical centre close by. The location, in advance of the artillery positions, was anything but ideal. The field surgical and field transfusion units had not yet secured their own instruments and supplies, and had to do the best they could with the relatively limited resources of the field dressing station. These circumstances, coupled with the sweltering heat, made it difficult to cope with the influx of casualties that began about two o'clock and continued in a fairly steady stream throughout the rest of the day to a total of over 80. No. 1 Field Dressing Station, after evacuating some 30 patients received during the previous night, closed on the 18th, as did No. 4 Field Ambulance.

The following afternoon, with the leading brigade engaged in levering the enemy from positions covering the road running northwards from Valguarnera towards Leonforte, No. 4 Field Ambulance and No. 1 Field Dressing Station, with No. 1 Field Surgical Unit attached, opened conjointly an advanced dressing station and advanced surgical centre in Valguarnera itself. The building occupied was a large school that had been in use as an Italian hospital. It contained large stocks of medical supplies, including

* British formations in the Eighth Army had not yet adopted the new British medical organization in its entirety. British field ambulances were still organized on the old basis, and each thus operated a main as well as one or more advanced dressing stations.

surgical instruments and dressings, which was a providential discovery for the field surgical unit. But also inherited were some 60 enemy patients, civilian and military, whose condition, along with that of the building, was recorded as "indescribable".

Valguarnera to Adrano

By 20 July the 1st and 2nd Brigades were approaching respectively the towns of Assoro and Leonforte, both situated on a commanding ridge overlooking the Dittaino Valley and strongly defended. Not until 22 July, after two days' heavy and costly fighting, were they captured and the way opened for a further advance.

Enemy resistance had by then virtually ceased in the western part of the island. The Canadian division was therefore ordered to swing eastward towards Adrano. Each step of the way was stubbornly contested. At Nissoria, Agira, and again at Regalbuto, the 1st and 2nd Brigades, assisted by the 231st British Infantry Brigade, were engaged in hard-fought actions; Regalbuto was occupied only on 2 August. The 3rd Brigade, advancing independently on a parallel course along the Dittaino Valley, was on 29 July placed temporarily under command of the 78th British Division to secure a bridgehead over the Dittaino at Catenanuova. This task successfully accomplished, and the 78th in possession of Centuripe, it returned to Canadian command and the main axis of advance on 3 August.

By the night of 5-6 August the last serious barriers to Adrano, the hills to the north and north-east of Regalbuto that covered the passage of the Troina and Simeto Rivers, had been cleared. The 3rd Brigade was sent forward to strike the final blow. But it was not to be. A bridgehead was secured across the Simeto early on the 6th, but orders were then received that Adrano was to be left to the British. That same day the 1st Division was withdrawn into Army reserve, its work over for the time being.

During the battles for Assoro and Leonforte, indeed until after that for Nissoria had begun on 24 July, the medical installations in Valguarnera, reinforced by No. 2 Field Surgical Unit and No. 1 Field Transfusion Unit, bore the brunt of the casualty load. For the first two days No. 5 Field Ambulance remained in situ south of Valguarnera to act as a staging post for casualties en route to No. 4 British Casualty Clearing Station at Caltagirone.* But it was then sent forward to a point some four miles north of Valguarnera, largely in anticipation of future requirements; though partially open, it remained comparatively inactive until the 24th. No. 2 Field Dressing Station moved to a position in reserve near the main installations. No. 9 Field Ambulance, which by this time had acquired sufficient vehicles and equipment to function satisfactorily, did the same, but late on 21 July was

* No. 4 British Casualty Clearing Station appears to have passed from Canadian control by 20 July and to have been moved from Medica to Caltagirone under Corps arrangements.

dispatched into the Dittaino Valley with the 3rd Brigade. There it opened an advanced dressing station near Raddusa-Agira Station, approximately eight miles north-east of Valguarnera.

A steady stream of casualties flowed into the forward medical installations from 20 to 24 July. During these five days there were 140 Canadians killed and 395 wounded.* The sick rate had also begun to rise.† Battle casualties and sick together placed a heavy strain on the medical facilities at Valguarnera, though No. 9 Field Ambulance of course received a proportion. Some found their way to the rear through British medical channels, but conversely British casualties were evacuated through Canadian units. The war diary of No. 4 Field Ambulance records the admission of 657 patients during the period 20-24 July: 547 Canadian, 89 British, 21 enemy. To complicate matters, it was the 24th before the last of the enemy patients and attendant medical staff were suitably disposed elsewhere and the space they occupied cleaned up and made available for our own casualties. No. 2 Field Dressing Station, though nominally in reserve, provided medical officers and an operating team to assist the active units. The two field surgical units worked in rotation, on 12 hour shifts. Most of the casualties received had to be evacuated, despite the desire of the A.D.M.S. to retain within the Division as large a proportion as possible of the sick and lightly wounded. Out of the 203 Canadian, British, and enemy patients admitted on 23 July, for example, all but 35 were evacuated to No. 4 British Casualty Clearing Station at Caltagirone.

Two other developments of this period merit notice. The first concerned the tactical employment of field ambulance companies in immediate support of brigades. Each section had thus far tended to follow immediately behind the battalion to which it was affiliated. On 20 July the A.D.M.S. directed that in future the three sections would function as a company, establish one casualty collecting post in the vicinity of brigade headquarters, and from this point send personnel and vehicles forward to evacuate casualties from regimental aid posts as required. This had already been tried out by at least one field ambulance and- found more economical of resources than the previous system. The second innovation was the loan of four wireless sets to medical units through the good offices of the officer commanding the divisional signals. One was retained by the A.D.M.S., and one sent to each of the three field ambulances. "As this was the first time that officers of a Canadian infantry division medical unit used R/T (radio telephony), it took about 10 days to get the best out of this means of communication".‡ Then it

* These are the total battle casualties for the period concerned, and thus include a few that occurred outside the Division, notably in the 1st Canadian Army Tank Brigade.

The same is true of the figures on battle casualties to be found in later pages of this chapter.

They do indicate, however, as accurately as is possible, the volume of work devolving upon medical installations at various periods.

† 11 /Sicily /1: Graph, Daily Incidence of Sickness, 10 July - 24 August 1943. This is the source of all statements relating to sickness within the Division in Sicily.

‡ Report by A.D.M.S., 1 Cdn Inf Div, *op cit.*

proved invaluable. "We have often wondered", the A.D.M.S. subsequently remarked, "how field ambulances could hope to function properly without wireless". *

Late on 24 July, by which time heavy fighting was in progress on the eastern edge of Nissoria, Canadian medical activity became centred about Leonforte. Around five o'clock No. 5 Field Ambulance opened an advanced dressing station in an orchard about one mile south of the town, alongside the main road from Valguarnera. No. 2 Field Dressing Station and No. 1 Field Surgical Unit arrived during the evening and opened an advanced surgical centre on the opposite side of the road. No. 1 Field Transfusion Unit joined them the following morning. An attempt that same morning to occupy a school building in Leonforte itself was thwarted by enemy artillery. These forward installations therefore remained in their rural setting, where they carried the main casualty load until 30 July. In the interval, No. 9 Field Ambulance stayed open at Raddusa-Agira Station, No. 1 Field Dressing Station was busy at Valguarnera with post-operative cases, while No. 4 Field Ambulance, after functioning as a staging post for a short time, closed completely.

Medical experience at Leonforte was similar to that at Valguarnera, except that only one field surgical unit was employed. Canadian casualties from 25 to 30 July inclusive, which period saw the 1st and 2nd Brigades finally push through to Agira in the face of heavy opposition and the 3rd Brigade capture Catenanuova, continued to be fairly heavy, totalling 119 killed and 446 wounded. On the 25th, the day of the 1st Brigade's fruitless effort to break through the enemy positions on the eastern edge of Nissoria, the heaviest casualties for any one day of the campaign were suffered: 45 killed and 150 wounded. The sick rate during this same period climbed another notch, though it fluctuated somewhat and by 30 July was showing a tendency to drop. Gastro-intestinal disturbances continued to head the list of causes, but cases of fever were becoming increasingly common. For the six days slightly more than 650 battle and non-battle casualties were admitted to No. 5 Field Ambulance according to the unit war diary. No. 9 Field Ambulance at Raddusa-Agira Station received a smaller but substantial number, and No. 2 Field Surgical Unit, after remaining at Valguarnera until the 28th, was dispatched to its assistance.

Where casualties were to be evacuated beyond the division, created a certain amount of difficulty at this stage of the campaign. The A.D.M.S. received instructions on 25 July to evacuate to Ramacca, where a British field ambulance was operating a main dressing station in conjunction with a surgical centre. On the morning of the 26th, Headquarters 30th Corps issued orders that the Canadian line of evacuation would remain, Caltagirone — Vizzini-Florida, until the Division was definitely advised that a casualty

* *Ibid.*

clearing station area had been established in the vicinity of Scordia to the south-east of Ramacca. Not until the afternoon of 27 July was this advice received. It was then laid down that all casualties west of Ramacca would be evacuated to No. 3 British Casualty Clearing Station through a British field ambulance.* By 31 July No. 4 British Casualty Clearing Station had moved from Caltagirone to join No. 3 in the Scordia area. The motor ambulance convoy responsible for clearing the 1st Canadian Infantry Division had some difficulty in keeping abreast of this march of events, with the result that for a day or so casualties tended to accumulate in forward units.

A considerable quantity of enemy medical stores was uncovered in Leonforte. When Colonel Playfair learned on 27 July that No. 5 General Hospital had lost almost its entire equipment by enemy action, he immediately undertook to re-equip it at least partially from this source. Within 48 hours, with the assistance of the Royal Canadian Army Service Corps, some 40 three-ton lorry loads of hospital equipment and supplies were transferred to No. 5 at Syracuse. Another 12 tons were sent from Canadian stocks in Modica.

This emergency measure made rather difficult the necessary re-distribution of divisional medical units on the night of 30-31 July, since some of the medical transport used had not returned from Syracuse by that time. An added complication was an influx of casualties to No. 9 Field Ambulance from the 3rd Brigade's attack on Catenanuova. By the morning of the 31st, nevertheless, No. 9 had an advanced dressing station open in a school building in Agira as well as the one at Radduso-Agira Station, and No. 1 Field Dressing Station, with No. 2 Field Surgical Unit attached, was operating an advanced surgical centre in another part of the same building, having borrowed transport to move essential personnel and equipment from Valguarnera. During 31 July the situation was tidied up. The advanced dressing station at Raddusa-Agira Station was closed, the balance of No. 1 Field Dressing Station was brought forward, and No. 1 Field Transfusion Unit joined the advanced surgical centre.

Canadian fighting was now centred about Regalbuto, and with a few minor alterations the above arrangements sufficed until the end of active Canadian participation in the campaign. No. 5 Field Ambulance and No. 2 Field Dressing Station remained just to the south of Leonforte. No. 1 Field Surgical Unit was attached to the advanced surgical centre in Agira on 1 August. No. 4 Field Ambulance remained in Valguarnera until 2 August, then moved to another position in reserve nearer the front though not before receiving some unpleasant attention from enemy bombers.

From 31 July to 6 August the Canadians lost 106 killed and 345 wounded. The sick rate during the same period showed a decided tendency to drop,

* W.D., A.A. & Q.M.G., 1 Cdn Inf Div, July 1943: Appx 4, A/Q Intelligence Log, 26, 27 July 1943.

but this improvement was more apparent than real. By 6 August gastrointestinal disturbances had been supplanted by fevers as the chief cause of sickness, marking the onset of what was shortly to become a serious epidemic of malaria.

During this final phase of the campaign, most Canadian casualties, and many from the 231st British Infantry Brigade, were cleared in the first instance to No. 9 Field Ambulance at Agira. Wounded not requiring treatment at the advanced surgical centre were further evacuated to No. 5 British Casualty Clearing Station at Ramacca until 5 August, then to a British field ambulance at Catenanuova; by this latter date the casualty clearing station was apparently in the process of moving to Paterno, where it opened on the 9th. So far as possible Canadian sick were retained at Agira, the overflow being sent back to No. 5 Field Ambulance at Leonforte. At both field ambulances accommodation for sick was provided in tents.

Within this general pattern, the day-to-day medical arrangements were extremely flexible. From 30 July until it returned to Canadian command on 3 August, for example, the 3rd Brigade's casualties were evacuated through British channels. On 1 August No. 9 Field Ambulance was receiving patients already treated at a British medical installation further forward. The only serious problem was that of clearing the 2nd Brigade once it swung off the main highway and began to move along and across the Salso Valley to seize the hills dominating the northern and western approaches to Adrano. In this almost trackless and extremely rugged country, wheeled transport, even the ubiquitous jeep, was useless. To carry the brigade's essential support weapons, reserve ammunition, and rations, a mule train was organized. For the evacuation of casualties, reliance had to be placed on the old-fashioned method of hand carrying by stretcher, since neither cacolets (a chair suspended from a pack saddle to carry wounded) nor litters were available.* Particularly in the case of the Loyal Edmonton Regiment, which lost 26 killed and 60 wounded between 2 and 6 August, this was no light assignment; on 3 August the hand carry involved was three and a half miles. Princess Patricia's Canadian Light Infantry and the Seaforth Highlanders of Canada, which together had 12 killed and 51 wounded, were at no time so far removed from points accessible to jeep ambulances as the Edmontons. Moreover, it is possible that they were able to make use of the tracked, universal carrier for the evacuation of stretcher cases as was done during the battle for Leonforte, although there is no documentary evidence to this effect.

The Canadians in Reserve

The withdrawal of the 1st Canadian Infantry Division from the line on 6 August brought little respite for medical units, nor did its subsequent move to a concentration area south of the Catania plain. The fighting was over,

* Report by D.D.M.S., 30th Corps, *op cit.*

but it had left a legacy of wounded. Hardly had these been evacuated when the problem of malaria became acute. The period following the cessation of actual fighting proved to be the most difficult of the whole Sicilian campaign for the R.C.A.M.C.

Medical Arrangements Generally

Until 12 August there was no change in medical dispositions. The units in reserve obtained a measure of relaxation, but No. 9 Field Ambulance and No. 1 Field Dressing Station at Agira and No. 5 Field Ambulance near Leonforte were fully occupied with battle casualties requiring post-operative care or with sick.

The number of sick was not yet abnormally high, but totalled 242 during the period 7-11 August inclusive, with malaria increasingly predominant. A divisional anti-malaria officer was therefore appointed and charged with improving the state of unit precautions; The three anti-malaria control units formed in the United Kingdom had been unable to bring any vehicles with them, and due to the transport losses at sea it had not been possible to provide any in Sicily; nor, for some unexplained reason, had their equipment ever turned up. Preliminary steps were now taken to reorganize and re-equip them.

Between 12 and 15 August, after the patients on hand had been either discharged to their units or evacuated to a casualty clearing station, all medical units moved with the Division to a concentration area bounded approximately by Scordia, Lentini, Sortino, Francofonte, and Militello. Due to inadequate liaison by reconnaissance parties, the site selected for medical installations was found to coincide with that desired by divisional headquarters. After a new one was chosen about a mile west of Sortino, the brigades, which were concentrated about Francofonte and Militello, promptly complained of the inaccessibility of the field ambulances. To rectify matters No. 4 Field Ambulance established an advanced dressing station about two miles south-east of Francofonte and ambulance car posts at each brigade headquarters.

Casualties were collected each morning from regimental aid posts and delivered to the advanced dressing station for triage. Those beyond the ordinary scope of field medical facilities were evacuated to No. 7 British Casualty Clearing Station at Lentini. The balance were sent to No. 5 Field Ambulance in the medical area east of Sortino. This unit held and treated all but malaria cases, which were transferred to No. 2 Field Dressing Station nearby. The latter, functioning as a malaria hospital, retained patients for about a week and then discharged them for convalescence to a rest station operating under medical supervision as a company of the Canadian re-inforcement battalion located near Syracuse. The only important change in these arrangements during the balance of the period in reserve was the

opening of No. 1 Field Dressing Station on 20 August to increase the capacity of the "Sortino Medical Centre". No. 9 Field Ambulance remained inactive throughout.

The Malaria Problem

The increasing sick rate in the 1st Canadian Infantry Division from 15 August onwards was due mainly to fevers. The war diary of almost every medical unit states quite clearly that the bulk of these were malaria or suspected malaria, the element of doubt arising mainly from the fact that laboratory facilities for positive diagnoses were unequal to the demands made upon them. Although there would appear to have been some attempt to play down the Canadian incidence of malaria in Sicily, there was in fact an epidemic of serious proportions during the latter part of August.

On 24 August the Assistant Director of Hygiene, 13th British Corps, to which the Canadian Division now belonged, suggested that the anti-malaria programme being carried out among the British personnel in the Corps should be adopted for the Canadian element, specifically that 10 grains of quinine should be administered daily for three days to 'blanket' the disease and thus conserve manpower for the forthcoming invasion of the Italian mainland, Operation "Baytown". In this recommendation he was supported by the officer commanding No. 8 British Malaria Field Laboratory. But the Canadian reaction was unfavourable:

A.D.M.S. did not agree with this proposal and objected because it was unscientific and he did not consider the incidence of malaria in 1 Cdn Div as excessive nor did he agree with their assumption that all NYD (not yet diagnosed) fevers were malaria. He also stated that so far manpower was not a problem with Canadians, and lastly, (that) the suggested routine would upset anti-malaria discipline in the Division and would lead to an epidemic of malaria at a future time producing chaos. . . *

Whatever the soundness of his views, the A.D.M.S. changed his mind about their practicability after a personal survey of the situation in the medical area. On 27 August he found his units filled to capacity, with little prospect of being cleared in time for "Baytown" unless drastic measures were taken. Accordingly, he reluctantly decided to apply the 'blanket' quinine treatment to the whole Division, to the sick and the well alike.† Upon the concurrence of the G.O.C., the necessary orders were issued to all unit commanders on the 28th.

The assigned cause of the outbreak was laxity in anti-malaria precautions by units and individuals during the period spent by the Division in the vicinity of Agira and Regalbuto‡, both situated in the midst of the highly malarious area encompassed by the valleys of the Dittaino and Salso Rivers.

* W.D.. A.D.M.S.. 1 Cdn Inf Div. 24 August 1943.

† *Ibid*, 27 August 1943.

‡ *Ibid*, August 1943: Appx 62, A.D.M.S. to all commanders of 1 Cdn Inf Div and attached units, 27 August 1943.

But this explanation seems too restricted. Until the Division arrived north of Valguarnera and began to fight its way eastward towards Adrano, it was comparatively unexposed to malaria. Since the incubation period for malaria is from 10 to 12 days, the laxity in many instances must have followed the cessation of actual fighting. Finally, the concentration area itself was in a malarious zone.

According to the best statistics available,* there were 1184 cases of actual or suspected malaria in the 1st Division up to and including 31 August 1943. Of this number 756 were diagnosed as malaria, and 428 were classed as not yet diagnosed (N.Y.D.). The significant feature is that the majority of these cases occurred during the latter half of August. In July there were only 21 actual or suspected cases. The total from 1 to 15 August was 120, but from 16 to 31 August it was 1043. In the light of all the facts, it would appear that the root cause of the Canadian malaria epidemic in Sicily was a general neglect on the part of units and individuals to implement the precautionary measures laid down, a neglect induced to a great extent by the inadequacy of anti-malaria training prior to the campaign and the consequent failure of non-medical personnel to appreciate fully the dangers of the disease. It is only too evident that as soon as the division was seriously exposed to malaria, cases developed rapidly, and that the disease was most rampant after the stress of battle gave place to a period of relative relaxation.

The Consultant Malariologist, G.H.Q., Middle East Forces, reported on 22 August with respect to the situation within the Eighth Army as a whole:

The present outbreak appears to have started about 1st August, since which date there have been 171 1 cases definitely diagnosed as malaria, and 4650 cases of pyrexia in which no definite microscopical diagnosis was made. It is most unlikely that all of these latter are malaria, as a considerable incidence of sandfly fever is to be expected in Sicily, but assuming them to be all malaria, the total number of cases is 6361.

This represents an incidence per 1000 per day of 0.36 definite malarias, 0.94 indefinite, with a total of 1.29 which is 40 per 1000 per month. . . †

The strength of the 1st Division and attached troops was approximately 15,500 on leaving the United Kingdom, though probably somewhat less by August despite reinforcements. For the 53 days from 10 July to 31 August, as previously stated, there were 1184 cases of actual or suspected malaria. Assuming them all to have been malaria, the daily incidence was thus 1.4 per 1000, a monthly one of 42.7 per 1000. If only the 756 cases actually diagnosed as malaria be considered, the daily incidence was 0.92 per 1000. It is to be remembered, however, that the Canadian epidemic reached its peak only during the latter half of August. The 1043 fever cases that occurred from 16-31 August, again assuming all to have been malaria, represent a daily

* 11 /Malaria/1 /2: Divisional Malariologist to A.D.M.S., 1 Cdn Inf Div. 10 November 1943, Appx C.

† United Kingdom records.

incidence of 4.2 per 1000, a monthly one of 128 per 1000. Considering only the 688 cases definitely diagnosed as malaria during this 16 day period, the daily incidence was 2.8 per 1000, or approximately 85 per 1000 per month. The situation was without doubt a serious one for both Canadians and British. A British historian had this to say about it:

When the Eighth Army landed in Sicily its conception of malaria prophylaxis was not two steps ahead of that which prevailed at the end of the last war. . . Sicily witnessed a medical disaster which repeated on a small scale many much-quoted episodes of previous wars but which did not, fortunately, affect the outcome. . .*

Consequently, every effort was made not only to bring the current outbreak under control, but also to guard against a recurrence. To this end, as many Canadian medical officers as possible were sent to British malaria centres for short courses of instruction, and the reorganized anti-malaria control units were attached to British units for training in field work.

THE FORTUNES OF THE NON-DIVISIONAL MEDICAL UNITS

No. 2 Light Field Ambulance

As a component of the Eight Army reserve, the 1st Canadian Army Tank Brigade landed at Syracuse between 13 and 17 July. It concentrated in the area about Cassibile, and on 21 July began to move northwards into the Catania plain. There, deployed along the Dittaino River to the north of Scordia, the brigade was allotted the task of covering the gap between the right flank of the 30th and the left flank of the 13th Corps. On 31 July one regiment was placed under the command of a British brigade to assist in defending two important bridgeheads across the Dittaino. Two squadrons of this regiment had brushes with the enemy during the early part of August but no serious encounters. On 11 August the 1st Canadian Infantry Division assumed command of the whole brigade. Its total battle casualties in Sicily, exclusive of the regiment under command of the 1st Division from the beginning, were only one killed and 45 wounded.

In these circumstances No. 2 Light Field Ambulance had relatively little work to do during the campaign itself. A main dressing station was established about three miles north of Scordia on 22 July. Sections were sent forward in rotation to maintain an advanced dressing station, and ambulance cars were attached to regiments as required.† But slight demand was made on these facilities. The greatest was the: arrival at the main dressing station during

* H.S. 952.013 (D45GG) *Operations of British, Indian and Dominion Forces in Italy, 3 September 1943 to 2 May 1945*, Part V "Administrative Monographs", No. 13 Medical Papers, Part I-The Battle Against Malaria (British Historical Section, Central Mediterranean; 31 March 1946).

† The organization of a light field ambulance enabled it to establish a main dressing station and several advanced dressing stations, differing in this respect from that of a field ambulance.

26-27 July of 40 casualties from the 1st Division, a result presumably of ambulance cars from No. 2 Light Field Ambulance being used at this stage of the campaign to assist in the evacuation of casualties from the 30th Corps. All of these patients were sent the following day to No. 3 British Casualty Clearing Station, at this date located in the Scordia area.

The 1st Army Tank Brigade proved no more immune to malaria than any other formation, and by 11 August an increasing number of fever cases were reporting for treatment. This trend continued until the last week of August, and on the 28th all personnel were placed on the suppressive quinine treatment. The incidence of malaria in the brigade cannot be determined precisely, since no record of the disease was maintained prior to 10 August. But subsequent to this date it paralleled the divisional one.*

Altogether, August more than compensated for the relative inactivity of July. Despite the small number of battle casualties, moreover, the campaign demonstrated quite clearly the need for a light field ambulance in an independent brigade, armoured or infantry. As the commanding officer later reported :

At no time during the Sicilian campaign were there adequate medical resources available to 1 Canadian Army Tank Brigade aside from 2 Canadian Light Field Ambulance. . . The field ambulance carried out all collection and evacuation of battle casualties and sickness (sic) over a large area. No help was received from (the) motor ambulance convoy and the field ambulance acted as its own motor ambulance convoy.†

No. 5 General Hospital

The personnel of No. 5 General Hospital landed at Augusta on 19 July. Next day they proceeded to the British medical centre that had been established in an Italian mental hospital on the outskirts of Syracuse. Pending the arrival of equipment and stores, two-thirds of which were sunk during an air raid on Augusta harbour, various officers, nursing sisters, and other ranks were attached to the casualty clearing stations operating the medical centre. Then, on the 23rd, it was decided that the Canadian unit should staff and operate on behalf of No. 15 British Casualty Clearing Station a 100-bed wing of the medical centre devoted to medical and minor surgical cases. This was taken over the following day, necessary equipment and stores being provided by the British. Not until 29 July did No. 5 begin to function on an independent basis, and then only by reason of the successful efforts made by the A.D.M.S., 1st Canadian Infantry Division, to re-equip it from captured stocks. On that date two buildings, each designed to accommodate approximately 100 patients, were taken over. By the end of the first day, there were approximately 250 on hand. On 30 July No. 5 Canadian General was detailed

* W.D., 2 Cdn Lt Fd Amb, August 1943, Appx 4.

† *Ibid*, September: Appx 5, C.O. to commander 1 Cdn Army Tank Bde, 6 September 1943.

to accept all admissions to the 'Syracuse Medical Centre' up to 4 p.m. to permit a British general hospital to relieve No. 15 British Casualty Clearing Station. When admissions finally ceased there were over 450 patients in the hospital, despite the evacuation of approximately 100 to a hospital ship during the morning. Tarpaulins were therefore suspended over the courtyards to provide space for 200 patients on stretchers.

By the acquisition of another building, and by the use of tarpaulins to the fullest possible extent, the unit's bed capacity was eventually increased to approximately 650, even though it continued while at Syracuse to act more as a casualty clearing station than a hospital. Patients were sent elsewhere almost daily by hospital ship, hospital carrier, or aircraft, but for a time admissions more than kept pace with evacuations. At midnight, 7-8 August, the hospital population was 656; this was the peak.

The hospital began to move to Catania on 10 August but, as there were some 135 three-ton lorry loads of equipment, stores, and personnel to be shifted, the process extended over a period of several days. The new site, a modern tuberculosis sanatorium on the north-west edge of the city, had been a Luftwaffe medical centre since March 1941. In vacating the buildings, the Germans had contented themselves mainly with destroying or immobilizing electric motors. But by the time the British arrived, the inhabitants of Catania had thoroughly pillaged the place, destroying what they could not carry away. A British field ambulance first occupied the shattered premises, while British engineers undertook to repair the worst of the damage. As a result of their efforts, the Canadian hospital was able to open there on 18 August. Until the 27th, the only electric power available was that supplied by a re-conditioned German generator. It was sufficient for the requirements of operating rooms and boiler rooms, but in the wards hurricane lanterns and flashlights had to be used. Initially, 400 beds were set up and equipped. Before the end of the month the required bed capacity was set at approximately 800, achievable only by establishing roof and balcony wards under tarpaulins and by utilizing folding cots in corridors.

The majority of admissions at Catania up to the end of August were malaria cases. Since instructions had been issued to retain these on the island for treatment, there was some congestion in the wards until a Malaria Continuation Treatment Centre was opened under British supervision on the 23rd. The opening of a Canadian Medical Rest Station just south of Catania at about the same time further improved the situation. This ad hoc unit, organized in the Syracuse area early in August, was intended primarily as a place of convalescence for minor medical or surgical cases after discharge from hospital, and for functional nervous cases. The purpose was to stem the flow of unnecessary evacuations from the island and thereby effect an economy in reinforcements. It functioned for administrative purposes under the control of No. 1 Canadian Base Reinforcement Depot, as a company of the battalion established in Sicily, but was under the command of a medical

officer. By the end of August it was dealing mainly with convalescent malaria and other fever cases. The restriction imposed on the evacuation of malaria cases from Sicily had nevertheless to be temporarily lifted towards the end of the month in order that hospitals might be cleared in preparation for Operation "Baytown".

The fates were assuredly not kind to No. 5 General Hospital in Sicily. On the evening of 2 September to cap previous misfortunes, 12 nursing sisters and three other ranks were wounded by an anti-aircraft shell that fell and exploded on the roof of one of the hospital wings during an air-raid on Catania harbour. Unluckily the roof was being used as an out-door mess for nursing sisters. The shell exploded about ten feet from the tables just as the sisters present and the mess waiters were in the process of seeking shelter inside the building. Needless to say the incident caused considerable commotion, especially since all the wounded required varying amounts of surgical attention and had to be admitted to the hospital as patients.

Generally speaking, every effort was made to channel Canadian casualties into No. 5. But since it did not begin to function independently until 29 July, it seems probable that about 50 per cent of Canadian battle casualties were evacuated to North Africa through British hospitals or casualty clearing stations. In this respect the British were most co-operative, endeavouring to ensure the evacuation of Canadians to Tunis or Philippeville rather than to Tripoli or ports even farther east so that they would more easily reach the area in North Africa where No. 15 Canadian General was located.

No. 15 General Hospital

The staff of No. 15 General Hospital disembarked at Philippeville on 11 July. On the 13th, an advance party proceeded to the site selected for the hospital near El Arrouch, approximately 21 miles inland from Philippeville. The remaining personnel followed within a few days, except the nursing sisters, who were left behind to await the provision of accommodation. Equipment and stores were unloaded at Bone, and reached the unit with little delay.

The site at El Arrouch was anything but ideal. On a steep slope, in an undulating valley about six miles long by four miles wide, it was exposed throughout the day to the direct rays of the tropical sun. The soil was clay, so that in the rainy season poor drainage and deep mud could be anticipated. Malaria of the malignant type was prevalent in the area. The distance from No. 1 Canadian Convalescent Depot and No. 1 Canadian Reinforcement Depot, both located along the coast near Philippeville, was unsatisfactory from the administrative standpoint. The commanding officer was strongly of the opinion that his unit had been located most disadvantageously, as it appeared to him that there were almost ideal hospital sites potentially available along the coast. In a written protest to the senior Canadian military representative in North Africa, he stated:

There are sites on the seaside at Philippeville which are almost ideal for a hospital; there are indeed two British hospitals there already. It is understood that the shortage of water was the deciding factor but as the water supply at El Arrouch is drawn off the Philippeville source of supply there would appear to be no reason why it could not also be diverted to these more suitable locations which are presently occupied by Training Depot. . . .*

This was passed on to Lieutenant-General McNaughton, then visiting North Africa, who took the matter up with senior British officers during a conference held at Headquarters Tunis District on 17 July. He was promised that the situation would be reviewed.† But for whatever reason no alternative site was ever found.

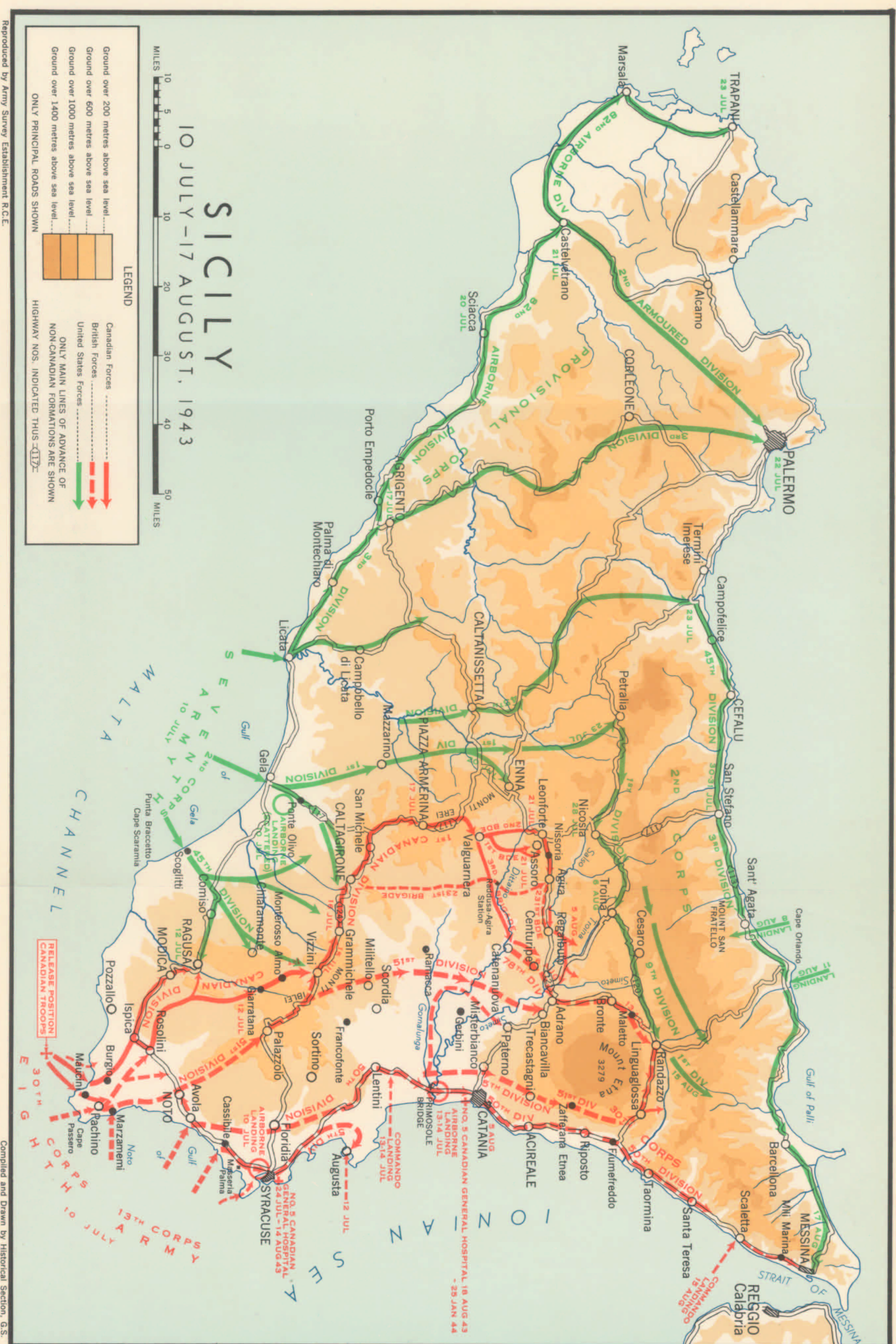
Before the unit could function at all, a tented hospital had to be erected literally from the ground up. There had been a minimum of preparatory work: a central road had been excavated; water, derived from the main Philippeville source, had been piped in and a 7200 gallon storage tank erected; a second tank was in the course of construction; one cookhouse had been entirely completed, two others partially; of the cement floors required, only one had been laid. The British construction plans called for a wide dispersal of single hospital tents, which the unit considered impracticable with the existing sanitary facilities and in the absence of roads. New plans had consequently to be prepared on the spot. Nevertheless, by dint of strenuous efforts in temperatures that hovered around the 100 degree mark, it proved possible to accept patients on 24 July, only 12 days after the unit landed in North Africa.

Much of the work to be done was an engineering responsibility, and beyond the capacity of unit personnel. Inevitably, therefore, it was some considerable time after the first patients arrived before all facilities desirable in a hospital became available. Electricity, supplied by a generator of a nearby British hospital, came into limited use on 27 July. The operating room was completed on the 28th, but the cement floor was of such poor quality that it had subsequently to be re-laid. Laboratory and x-ray facilities were not in full operation until 8 August. Electric lighting became available throughout the hospital only on the 17th. It was ten days later, after repeated complaints to higher authority, before the installation of a proper drainage system was begun. It was still later before the remaining engineer projects were under-taken, notably a road system.

Despite these construction difficulties and the ravages of a severe wind storm or "sirocco", which early in August blew down half the tents, the hospital handled a large number of patients from 24 July onwards. Every effort was made to have all Canadians arriving in the area admitted directly. The difficulty was to secure advance information as to the number of

* W.D., 15 C.G.H., July 1943: Appx 5, C.O. to Senior Officer, Cdn Section G.H.Q. 1 Ech, 15 Army Gp, 13 July.

† 3/Sicily/1/3: Minutes of Conference held on 17 July at White House, H.Q. Tunis District.



SICILY

10 JULY-17 AUGUST, 1943

LEGEND

Ground over 200 metres above sea level: [Orange shading]

Ground over 600 metres above sea level: [Lighter orange shading]

Ground over 1000 metres above sea level: [Yellow shading]

Ground over 1400 metres above sea level: [Lightest orange shading]

ONLY PRINCIPAL ROADS SHOWN

Canadian Forces: [Red line]

British Forces: [Green line]

United States Forces: [Blue line]

ONLY MAIN LINES OF ADVANCE OF NON-CANADIAN FORMATIONS ARE SHOWN

HIGHWAY NOS. INDICATED THIS WAY: [Line with number]

MILES 10 5 0 10 20 30 40 50

Reproduced by Army Survey Establishment R.C.E.

Compiled and Drawn by Historical Section, G.S.

Canadian patients aboard ambulance trains reaching Philippeville from the forward hospital area in Tunisia. As a result, many Canadians were admitted initially to a British hospital and later transferred; conversely, many British patients were admitted to the Canadian installation. It was not until the latter part of August, when some hospital ships began to dock at Philippeville, that this situation materially improved.

On 31 July there were 347 patients on hand, of which only 61 were Canadian. On 31 August the total number of patients was 1013, and on the previous day alone 220 Canadians had been admitted, mostly malaria convalescents transferred on the hospital ship *Dorsetshire* from No. 5 General. Altogether, from the date of its opening to 31 August, No. 15 admitted a total of 2226 patients, of which 1386 were Canadian.*

Despite the initial forebodings, malaria did not in fact prove a serious menace either to the efficient functioning of the hospital or to the health of the staff and patients. This was due primarily to the introduction of efficient control measures. In addition to the normal personal precautions insisted upon, some dozen members of the unit, assisted by more than three times that number of Arabs, were permanently employed in locating and destroying mosquito breeding areas. Although there were numerous malaria patients in hospital, the number of cases among unit personnel was negligible.

* 11 /Sicily /1 : Report on Medical Division, 15 C.G.H. from 25 July 43 to 31 August 1943.

Southern Italy

The final plan for the invasion of Italy involved a two-phased attack. On 3 September, as Operation "Baytown", the Eighth Army would cross the Strait of Messina and land on the toe of the peninsula. A few days later the United States Fifth Army of one American and one British corps would launch an assault in the Gulf of Salerno to the south of Naples; simultaneously, as a secondary effort, the 1st British Airborne Division would be landed by sea at Taranto. Together, it was hoped, these attacks would eliminate all enemy forces in the foot of the Italian boot and open the way to Rome.

At the head of the Eighth Army, the 13th Corps was to land the 1st Canadian Infantry Division in the vicinity of Reggio Calabria and the 5th British Division opposite Messina, each supported by a regiment of the 1st Canadian Army Tank Brigade. Well to the flanks, subsidiary operations were to be carried out by special forces. For the Canadians the 3rd Brigade was to seize the beaches north of Reggio, the immediate hinterland, and most of Reggio itself. The 1st Brigade, following close behind, would then pass through to take the airfield and high ground to the east of it. Once the 2nd Brigade and the 14th Tank Regiment had assembled ashore, the Division was to advance to the north-east through the Aspromonte range of the Apennines on the general axis Reggio-Delianuova.

Medical Plans

The 13th Corps medical plan for "Baytown" was similar in principal to that of the 30th Corps for "Husky". But the relatively short sea passage from Sicily to Italy considerably simplified the problem, and the experience so recently gained of medical requirements in amphibious operations proved invaluable in working out the detailed plan. Moreover, the various medical staffs were on this occasion closely associated during the planning phase.

The control of medical units was largely decentralized for the assault phase, although the D.D.M.S. retained a few miscellaneous units under his own command. Added to the normal medical complement of the 5th British Division were two British casualty clearing stations, two field surgical units, one field transfusion unit, and two beach brick* medical sections. The

* "Beach Brick" was an early term for what later developed into the "Beach Group". The use of the earlier term and form of organization persisted longer in the Middle East than in the United Kingdom; the Beach Groups used in Sicily were provided from the United Kingdom. Basically, the "Brick" was a special unit built around an infantry battalion for the specific purpose of controlling an assault beach and providing the personnel necessary to maintain a force over it. The "Group", designed to do the same work, was also built around an infantry battalion, but as the name implies, was more a collection of specialist sub-units than a homogeneous unit of specialist personnel like the "Brick".

Canadian divisional medical units, including for this operation No. 2 Light Field Ambulance, were reinforced by No. 34 British Beach Brick Medical Section. Available to the 231st British Infantry Brigade in Corps reserve were a field ambulance, a field surgical, and a field transfusion unit. From D plus two, ambulance cars of a British motor ambulance convoy were to be available in Italy under the operational control of the D.D.M.S.

Once a landing was effected, all casualties were to be held by the rear-most medical units until the D.D.M.S. could make arrangements for their evacuation in empty tank landing craft. It was anticipated that hospital ships would be available for their reception at an anchorage near Santa Teresa, Sicily, but if not, they were to be distributed to medical installations on the island. This would remain the basic system of evacuation until such time as hospital ships should be permitted to enter the harbour of Reggio. As a supplement, evacuation by air was to be instituted as soon as landing strips became available, and very detailed instructions were issued as to the selection and priority of casualties for this means of transport.

The problem of malaria received special attention. Provision was made for anti-malaria control units on a scale of two per division and one per corps, for the distribution of 'malaria maps' down to unit medical officers, and for the circulation of information obtained by the malaria field laboratory during the course of the campaign. Precise instructions as to personal pre-cautions were issued and a programme for the destruction of adult mosquitos prepared. Further, the medical authorities recommended that shorts be withdrawn and long trousers worn by all ranks at all times. It had become evident during the Sicilian campaign "that most troops who went into action wearing shorts would not, and often could not, change into slacks after sundown, and it was realized that it would have been better not to have issued shorts at all".*

The purely Canadian medical plan was quite simple. No. 9 Field Ambulance, under command of the 3rd Brigade, was to be the first medical unit ashore, and was to open a temporary beach dressing station for the brigade until such time as an advanced dressing station could be established in Reggio. No. 34 Beach Brick Medical Section, which was also to land with the 3rd Brigade, was charged with the chief responsibility for the reception and treatment of casualties on the beaches. A detachment from No. 4 Field Ambulance was to supply personnel for the care of wounded ferried to Sicily on tank landing craft. The balance of NO. 4, with NO. 1 Field Surgical Unit and No. 1 Field Transfusion Unit attached, and No. 2 Field Dressing Station, with No. 2 Field Surgical Unit attached, were to land under command of the 1st Brigade. As soon as possible, the two latter units were to

* H.S. 952.013 (D45GG): *Operations of British, Indian and Dominion Forces in Italy, 3 September 1943 to 2 May 1945*, Part V, "Administrative Monographs", No. 13 Medical Papers, Part I - The Battle Against Malaria, p. 3 (British Historical Section, Central Mediterranean, 31 March 1946).

open an advanced surgical centre near the advanced dressing station in Reggio. How the rest of the medical service, including No. 4 Field Ambulance and its attached units, was to be deployed hung more or less on the dictates of circumstance. Although the A.D.M.S. prepared a plan for the initial stages of the advance, it could be only tentative in nature until the probable course of events became clearer. Actually numerous changes were necessary, but it will suffice to note that all divisional medical units were to be available in Italy by D plus seven and once ashore were to revert to the direct control of the A.D.M.S.

Reggio to Potenza

When the Anglo-Canadian assault against Italy was launched in the early morning of 3 September, the opposition encountered was negligible. Though still at war officially; the Italians were little interested in further fighting. The Germans, suspicious both of Italian intentions and of allied landings further north, had decided not to make a serious stand in Calabria. By the end of the day the attackers had secured their initial objectives and begun to push inland, the British along the western coast road, the Canadians through the rugged mountains of the Aspromonte. By 8 September, the day on which the Italian surrender was announced, it had been decided to switch the main Canadian axis of advance to the eastern coast road, and by nightfall the leading elements of the 3rd Brigade had made their way down from the hills to Locri. Within a few days most of the Division was concentrated in the vicinity of Catanzaro, with patrols occupying Crotona on the coast to the north-east.

It was of the utmost importance to push on as rapidly as possible, for the issue at Salerno, where the Fifth Army had landed on 9 September, was in grave doubt. The 13th Corps was nevertheless obliged to halt temporarily in the Catanzaro isthmus to permit the administrative services to catch up with the fighting troops. The 5th British Division reopened the general advance on 14 September and on the 16th finally made contact with the right flank of the Fifth Army's bridgehead. The Canadian Division meanwhile had seized the principal towns in the highly malarious plain lying to the east and south-east of Castrovillari.

To strengthen the link with the Fifth Army now became the immediate object. The Canadians were therefore directed to seize the important communications centre of Potenza, and, as a subsidiary task, to join hands with the British force landed in the Gulf of Taranto. The 3rd Brigade, headed by a highly mobile striking force, reached Potenza without encountering serious opposition, but had a stiff fight with German defenders before occupying the town on the 20th. The 2nd Brigade, following closely, promptly began to patrol vigorously in the direction of Melfi to the north. The 1st Brigade, in carrying out the Division's subsidiary task, had meanwhile dispersed itself

over the wide expanse of country separating the 5th Corps in the Taranto area from the main body of Canadians about Potenza. The end of September found these positions basically unchanged.

The chief medical problem during this first phase of the Italian campaign was to maintain an efficient system of evacuation over the rapidly lengthening lines of communication. Although Canadian battle casualties were in fact extremely light, totalling only 32 killed and 146 wounded up to the end of September,* there was always the possibility of a serious engagement with the enemy and a resultant heavy flow of wounded. There was in any case a daily quota of sick, which, although no greater than was to be expected, accounted for approximately 1500 admissions to divisional medical units during the month.† That the medical service was always able to meet its responsibilities is a tribute to the skill with which advantage was taken of its inherent organizational elasticity.

Late on 3 September No. 2 Field Dressing Station and No. 2 Field Surgical Unit had joined forces with No. 9 Field Ambulance in a large school building in Reggio as planned. This conjoint advanced dressing station and advanced surgical centre remained the pivot of Canadian medical arrangements until the Division concentrated in the Catanzaro area. Further forward advanced dressing stations were opened in the Aspromonte, on 6 September in the vicinity of Gambarie by No. 5 Field Ambulance, on 7 September at Delianuova by No. 4. To each in turn No. 1 Field Surgical Unit and No. 1 Field Transfusion Unit were attached; they reached the one at Delianuova just in time to assist in dealing with the casualties suffered by the West Nova Scotia Regiment in a brief but bitter encounter with Italian paratroops. The ambulance journey to Reggio was slow and difficult, by reason of congested traffic on poor roads made worse by enemy demolitions, until the brigades began to move down from the mountains and up the east coast. Then a medical staging post was opened at Locri, where battle casualties and sick brought down from the direction of Catanzaro, and those remaining to be evacuated from the Aspromonte, were transferred from field ambulance transport to ambulance cars of the motor ambulance convoy for onward transmission. No. 1 Field Dressing Station first operated this staging post. But on 12 September it was relieved by a field ambulance company and moved to Catanzaro, where it opened in a modern hospital alongside No. 5 Field Ambulance. No. 1 Field Surgical and No. 1 Field Transfusion Unit joined them on the 13th.

By this date the line of evacuation back to Reggio, ending either at the Canadian installations or at a British casualty clearing station which had opened there on 5 September, was over 100 miles in length. It was therefore

* H.S. 133.065 (D345) Casualties-Italian Campaign: Casualty States for the Campaign in Italy, 3 September 1943 - 8 May 1945, by machine records. Unless otherwise stated, this is the source of all figures on battle casualties in the Italian campaign.

† 11 /AAI 1 Div./1: Quarterly Report, A.D.M.S., 1 Cdn Inf Div, September - November 1943.

decided to route casualties within the 13th Corps to another British casualty clearing station, located well forward at Vibo Valentia near the west coast. The Canadian medical units in Reggio thereupon closed down, and by the 15th they too had rejoined the main body of the Division.

When the northward advance was resumed, Nos. 4 and 9 Field Ambulances accompanied the 1st and 3rd Infantry Brigades respectively. As a precaution against a sudden rush of battle casualties, No. 5 Field Ambulance was directed to open an advanced dressing station about one mile north of Crotona. No. 1 Field Dressing Station was left at Catanzaro to evacuate or complete the treatment of approximately 130 patients being held there. No. 2 Field Dressing Station, the two field surgical units, and the field transfusion unit were retained in reserve, moving forward on 17 September with the last of the divisional convoys.

The forward field ambulances had to open infrequently while the line Potenza — Taranto was being seized, mainly to evacuate sick. By 19 September No. 4 had an advanced dressing station just south of Scanzano. On the afternoon of the 20th No. 9 arrived in Potenza, where No. 2 Field Surgical Unit joined it the next day. On the 22nd a proper advanced surgical centre was established there, based on No. 2 Field Dressing Station, No. 1 Field Dressing Station, having completed its task at Catanzaro, opened partially on the 23rd at Anzi, about ten miles south of Potenza. No. 4 Field Ambulance remained near Scanzano until the 27th, but then moved to a new site just north of Gravina to continue serving the 1st Infantry Brigade.

Contrary to his original intention, the A.D.M.S. had been forced to leave No. 5 Field Ambulance at Crotona as a clearing centre for all Canadian casualties. By 19 September the ambulance journey to Crotona, with the forward troops over 100 miles away even as the crow flies, had become so long that arrangements were made to utilize for casualty evacuation purposes the infantry landing craft plying between Crotona and beaches close to the divisional maintenance area being organized a few miles south-east of Rotondella. The reserve company of No. 4 Field Ambulance, the medical unit closest to the scene, was detailed to function as a beach evacuation centre, and for the next few days all Canadian wounded and sick traversed the sea route to No. 5 Field Ambulance. The medical units in Potenza began to evacuate to a British casualty clearing station at Sapri on 21 September, but No. 4 Field Ambulance continued to send patients by sea to Crotona until the 25th, when it became possible to evacuate by air from Scanzano. It was the 27th before No. 5 Field Ambulance was able to close down and begin the long trek northward.

From Crotona the seriously ill and the relatively few battle casualties were evacuated by air to Sicily. Most of the minor sick were retained pending recovery, although some were sent to the British casualty clearing station at Vibo Valentia until it closed about 22 September. To accommodate bed patients every stitch of available canvas was erected, and for those who were

convalescent a special camp was established. On 21 September there were 160 patients in the improvised field hospital at Crotona and 60 in the convalescent camp, but by the 27th the grand total had been reduced to less than 50, most of them convalescent. The few bed patients remaining when No. 5 Field Ambulance finally closed were turned over to a British field ambulance, while the convalescents were left in the charge of the medical officer of No. 4 Canadian Reinforcement Battalion.

By the end of September the line of evacuation from Potenza led through a British field ambulance at Matera to British medical installations at Taranto, since the British casualty clearing station at Sapri was in the process of moving to Barletta on the east coast. No. 4 Field Ambulance at Gravina was evacuating to a British casualty clearing station at Bari. All Canadian medical units were again at full war establishment, in so far at least as such a condition is possible during active operations. At various stages during the advance from Reggio not only the rear parties left in Sicily, but also the personnel, vehicles, and equipment originally left in the United Kingdom, had rejoined their respective units.

Potenza to Campobasso

At this time the allied armies held a line extending from sea to sea roughly north of Naples and Foggia but bulging considerably southward in the central region. In the Eighth Army sector on the Adriatic flank, light forces pushed forward by the 5th Corps had occupied most of the vital Foggia plain. Patrols from the 2nd Canadian Infantry Brigade had entered Melfi on 27 September. Those of the 5th British Division were probing the area further to the west, and maintaining contact with the Fifth Army around Naples. The Taranto area was being developed as the Eighth Army supply base in place of Reggio. With Rome remaining the principal allied objective, it had been decided that the Eighth Army should now seize the line Campobasso - Termoli. To this end the 13th Corps was to launch an attack from the Foggia plain with the 1st Canadian and 78th British Divisions, each supported by armour. The Canadians were to advance through the mountainous region to the west and capture the two important towns of Vinchiatturo and Campobasso, while the British moved on Tennoli by land and sea along the coast.

The main body of Canadians moved from the Potenza-Melfi area on 30 September to concentrate with the 1st Infantry Brigade along the south-eastern edge of the Foggia plain southward of Canosa. Next day the 1st Brigade, preceded by a strong advance guard that included the 14th Tank Regiment, surged forward across the plain to take the main road to Campobasso through Lucera and Volturara. Behind it was the 2nd Brigade, which was to strike off over secondary routes and open country to secure Vinchiatturo and thus approach Campobasso from the south. The 3rd Brigade for the moment was retained in reserve.

The enemy now began to offer increasingly stubborn resistance, making skilled use of the numerous defensive advantages conferred by the terrain and retiring only under strong pressure. Beginning at Motta Montecorvino, the 1st Brigade found its way barred by a succession of enemy rearguards strongly posted, as did the 3rd Brigade when it was placed in the van on the northern route. Both brigades had to fight several stiff actions and overcome numerous obstacles both natural and artificial before Campobasso was finally reached on 14 October. The 2nd Brigade was somewhat less actively opposed, but even so, such was the nature of the country that it was able to occupy Vinchiatturo only on the 15th. The 12th Canadian Tank Regiment meanwhile had made a notable contribution to the capture of Termoli by the 78th Division.

In view of the intention to develop Campobasso as an administrative centre, it was necessary immediately on its capture to drive the enemy beyond the Biferno River, and thus out of artillery range. With this accomplished, the Canadian Division undertook during the latter part of October to clear the far bank of the Biferno as well. November was relatively quiet, though constant pressure was maintained on the enemy. In the latter half of the month the 3rd Brigade carried out an independent mission along the upper Sangro River, one purpose of which was to mask the preparations being made for a full-scale British attack across the lower Sangro.

The stiffening enemy resistance encountered during the drive to Campobasso is reflected in the casualty figures. From 1 to 15 October there were 147 Canadians killed and 401 wounded,* almost five times the number killed and three times the number wounded during the whole of September. Clearing the banks of the Biferno during the second half of October cost a further 251 casualties, 58 of them fatal. In November there were only 39 killed and 102 wounded. On the whole, sickness presented a more serious medical problem than battle casualties. In October, according to the best figures available†, there were 2572 non-battle casualties in the Division, mostly cases of undiagnosed fever, malaria, and infectious hepatitis (jaundice). This represented a daily wastage of 0.48 per cent against the calculated normal of 0.3 per cent and a potential danger to Canadian fighting power, for the main reinforcement pool was still far to the rear. Every effort was therefore made to retain in divisional medical units all sick who could be expected to recover within 10 days. The same policy was pursued throughout November, even though the total number of sick for the month was only 1859.

Until the capture of Campobasso, casualties from all three brigades were normally cleared by the forward field ambulance companies to an advanced dressing station maintained well forward on the northern axis by No. 4 Field Ambulance. It was established initially just to the west of Lucera,

* Included in these figures are the 5 killed and 4 wounded in the 12th Canadian Tank Regiment.

† Quarterly Report, A.D.M.S., 1 Cdn Inf Div, *op cit*.

subsequently at Motta Montecorvino, Volturara, and Riccia. An advanced surgical centre based on No. 1 Field Dressing Station opened at Motta on 5 October and moved to Volturara on the 10th. No. 5 Field Ambulance remained in a large school building at Lucera to hold fever and jaundice cases. One field surgical and the field transfusion unit were several times employed at the advanced dressing station.

At the request of the D.D.M.S., 13th Corps, No. 2 Field Dressing Station and No. 1 Field Surgical Unit were ordered to Foggia on the night of 5-6 October to assist the British medical units there in handling the casualties suffered in the fighting around Termoli. The field surgical unit was first attached to a British field ambulance, but only until the field dressing station opened. At the end of 48 hours from the time of its arrival in Foggia the total number of operations performed stood at 31. It had then to be dispatched to the advanced surgical centre at Motta along with No. 1 Field Transfusion Unit, which had been sent to Foggia on the 6th as a further reinforcement. No. 2 Field Dressing Station, its wards full of post-operative and other cases, remained where it was for the time being. It had just completed what the war diary describes as "the hardest task that the unit had ever undertaken", having admitted 269 patients in one and a half days.

The 2nd Brigade, fighting in the area south-west of Volturara around the Decorata crossroads, found that rain had made impassable the single lateral road connecting it with the northern axis. On 8 October, consequently, the reserve company of No. 9 Field Ambulance was dispatched to Castelfranco to clear all casualties from the 2nd Brigade by a southerly route, surgical cases to No. 2 Field Dressing Station, those with fever or jaundice to No. 5 Field Ambulance at Lucera, all others to the British casualty clearing station at Barletta. Within a few days, evacuation through No. 4 Field Ambulance was resumed in view of improved weather conditions and the forward movement of the brigade.

Soon after the capture of Campobasso, the A.D.M.S. began to build up a medical centre there. No. 9 Field Ambulance, which thus far had been held in reserve except for a company with the 3rd Brigade, opened in Campobasso on 16 October for casualties from the 1st and 2nd Brigades. It was joined the same day by No. 1 Field Surgical Unit and No. 1 Field Transfusion Unit, and on the 20th by No. 2 Field Surgical Unit. The medical centre took final shape on the 22nd with the arrival of No. 2 Field Dressing Station from Foggia. No. 4 Field Ambulance remained open at Riccia until 20 October for the benefit of the nearby 3rd Brigade, but it then had to make way for elements of 13th Corps Headquarters. Thereafter, until the end of November, Campobasso was the focal point of all Canadian medical activity.

Once the medical centre at Campobasso was fully organized all Canadian casualties were collected there, and it soon had a constant population of about 300. Those requiring further evacuation were carried as far as a staging

post in Volturara by the American Field Service Ambulance Company* and there transferred to a British motor ambulance convoy for the rest of the journey over the difficult and tortuous evacuation route of some 65 miles, first to Foggia and later to San Severo. To reduce the number of casualties requiring evacuation No. 5 Field Ambulance, still at Lucera, functioned as a convalescent centre for all ranks, having been open in this capacity for officers since the end of October.

During November the only medical development of interest was the dispatch of No. 4 Field Ambulance and No. 2 Field Surgical Unit to the upper Sangro with the 3rd Brigade. The advanced dressing station was established at Civitanova, whence casualties were sent back to the medical centre at Campobasso, a distance of about 40 miles.

During October and November No. 2 Light Field Ambulance continued to experience difficulty in fulfilling its intended role with the 1st Army Tank Brigade, due to the wide dispersion of the tank regiments. A main dressing station was opened about midway between Lucera and Foggia early in October, but with one section attached to the 12th Tank Regiment in the Termoli area and another to the 14th Tank Regiment on the opposite flank of the 13th Corps, co-ordinated action as a unit was almost impossible. Since the 11th Tank Regiment was still en route to the battle area, the main dressing station during most of October served chiefly brigade headquarters, the administrative echelons of the brigade, and such Canadian or British units as happened to be located in the vicinity. Most of the brigade's battle casualties were cleared by the detached sections through the evacuation channels of the formations with which they were serving. Evacuation from the main dressing station was to one or other of the British casualty clearing stations in the area.

Similar circumstances prevailed when towards the end of October the whole of the 1st Canadian Army Tank Brigade was gathered together in the general area of Campobasso. Whenever they were used, the tank regiments continued to be employed singly in support of the infantry. Hence the main dressing station established by No. 2 Light Field Ambulance, first near Iesi and later at Riccia, had as its primary function the reception of patients from that portion of the brigade not committed to action. Following previous policy, as many as possible of these were retained for treatment in order to reduce the manpower wastage in the brigade. When during the latter part of November the whole brigade came under the command of the 5th Corps and moved to a concentration area in the vicinity of Termoli all patients being held were evacuated to a British casualty clearing station at Campobasso.

* Two platoons of the American Field Service Ambulance Company, a volunteer unit raised by the Society of Friends and attached to the Eighth Army, had been allotted to the 13th Corps at the beginning of the advance from the Foggia plain. A varying number of their 4 x 4 covered ambulance cars had served continuously with the Canadians and been found an invaluable supplement to normal resources.

Medical Arrangements Behind the Front

In the absence of a casualty clearing station or other Canadian link in the chain of evacuation between the Division and the general hospitals, it has been impossible to determine with any accuracy the ultimate disposition of Canadian casualties during these first three months of the Italian campaign. Many undoubtedly returned to the Division directly from the British casualty clearing stations. Most of those evacuated to Sicily arrived sooner or later at No. 5 General Hospital. No. 15 in North Africa received its patients, exclusive of local ones, as direct transfers either from No. 5 or from British general hospitals in Tunisia.

No. 5 General Hospital had remained at Catania. During the first half of September all the medical equipment and stores lost by enemy action were replaced from the United Kingdom, and the hospital was promptly expanded to more than 900 beds. In October, with the start of the rainy season, the tented wards had to be closed, The colder weather brought by November forced the closing of balcony wards and thus a further reduction in bed capacity. At the close of November the total number of equipped beds was 643. A total of 7086 patients, 1148 of them battle casualties, had been admitted since the unit first opened at Catania. Of the total number of patients, 4217, and of the battle casualties, 688 were Canadians. The others were mostly British or American but almost every allied contingent in the theatre was represented.*

No. 15 General Hospital at El Arrouch had continued to function as a base hospital for the reception and treatment primarily of Canadian sick and wounded. In practice, considerable numbers of British and other allied patients also arrived there. Of the 5138 admitted between 20 August and the end of November, 3790 were Canadians.† During October the maximum hospital population was 1187, the minimum 888. In November the procurement of additional tentage and beds permitted a substantial expansion. By the end of the month there was accommodation for approximately 1375 patients.

From No. 15 General Hospital Canadians were normally sent to No. 1 Convalescent Depot, but some were discharged directly to the base reinforcement depot as immediately fit for return to duty through reinforcement channels. Both units were still located in the Philippeville area. Medically unfit personnel requiring evacuation to the United Kingdom presented a difficult problem. On 18 September, 139 Canadian invalids were embarked on the Canadian hospital ship *Lady Nelson* at Philippeville, but this was the first occasion on which the direct transfer of such cases to the United Kingdom had been possible. Ordinarily, as dictated by official policy, they were sent to Algiers by ambulance train and there admitted to British hospitals

* 11 /AAI 5 GH /1: Quarterly Report 5 C.G.H., 19 July - 30 November 1943.

† 11/AAI 15 GH/1: Reports by C.O. 15 C.G.H. 9 October, 10 November, 15 December 1943.

to await embarkation. Aside from delays at Algiers, the journey of up to 20 hours was trying for the more serious cases. The British do not seem to have altered their policy formally, but in practice acceded to the Canadian desire to evacuate directly from Philippeville. The *Lady Nelson* again docked there on 1 November. At the end of the month No. 15 was holding many invalids pending another visit.

It is undeniable that both Nos. 5 and 15 General Hospitals were by November 1943 at an undesirable distance from the fighting troops. But it is necessary to recall the circumstances in which they were sent to the Mediterranean theatre. No. 5 was in effect a Canadian contribution to the total hospital resources of the Eighth Army. No. 15 was sent to North Africa for the specific purpose of receiving Canadian casualties arriving at this terminal of the British lines of communication. Neither could usefully be moved to Italy until at least an advanced base was established there, and then only within the terms of the overall administrative plan. It was not until October that a decision was finally taken by Allied Force Headquarters to set up an advanced base in Italy, and the general administrative situation remained uncertain until the end of the year.* The responsible Canadian medical authority (A.D.M.S., Canadian Section G.H.Q., 1st Echelon) had to content himself at the end of November with a tentative plan for moving the two hospitals and the convalescent depot to Italy early in 1944. Fortunately, two other Canadian hospitals had already arrived in Italy, directly from the United Kingdom.

Winter Campaigning, 1943-1944

The Struggle for Ortona

While the 3rd Infantry Brigade was engaging German attention along the upper Sangro, the main effort to breach the enemy's Winter Line† was launched across the lower reaches of the river by the 5th Corps. At the end of November, after bitter fighting in abominable weather, the commanding ridge overlooking the Sangro from the north had been firmly secured. Already the original conception of a clean break-through to the important lateral road running from Pescara through Avezzano to Rome had been abandoned in favour of a series of advances with limited objectives. The principal reason for this change of plan was the initial delay imposed by the bad weather. But the nature of the terrain would probably have enforced such a modification in any case. As the Canadians were to discover, the succession of steep-sided river valleys crossing the line of advance gave the Germans almost limitless opportunities for prolonged and bitter resistance.

* *Operations of British, Indian and Dominion Forces in Italy, op cit*, Part I, Section G, "Principal Administrative Aspects", pp. 32, 68.

† The Winter Line extended roughly along the Sangro River on the east and the Garigliano on the west. It was called by the Germans the Bernhard Line.

In securing the line of the lower Sangro, the 78th British Division suffered heavily. The 1st Canadian Division was brought down from the Campobasso area to relieve it before the 5th Corps launched the next phase of the offensive. This relief, carried out while in close contact with the enemy, was a complicated process and occupied several days. But by the evening of 4 December the Canadians had assumed full responsibility for the Corps' coastal flank, and the forward battalions were in position on the southern ridge of the valley containing the Moro River. On the 6th the 1st Canadian Armoured Brigade (the redesignated 1st Canadian Army Tank Brigade) began to relieve the British armour that had remained in the line under Canadian command.

The Canadian task was to force a crossing over the Moro River and secure Ortona, some two miles beyond its mouth. The 2nd Brigade opened the attack on the night of 5-6 December, but it was the 9th before a firm bridgehead was secured. There ensued ten days of costly fighting to dislodge the enemy from a gully running parallel to and approximately 200 yards south of the road from Ortona to Orsogna. The Gully, a now well-known designation for this topographical feature, differed little from the many other ravines which beset the Canadians in their advance up the coast; its tactical possibilities, however, were exploited to the full by the Germans. At one time or another all three brigades, supported by tanks and artillery, were thrown against this position, and all were badly battered. Not until the 19th, after a final desperate assault supported by every bit of available fire power, did our troops clear the Gully and capture the vital intersection of the Ortona-Orsogna road with the highway leading north from San Leonardo. The way to Ortona was at last open, but fanatical German paratroops contested its streets yard by yard until the night of 27-28 December. Christmas 1943 was anything but a day of peace and goodwill on the Canadian battlefield.

Canadians could look with some pride upon their achievements during December, but a high price had been paid. Battle casualties from 5 to 28 December inclusive totalled 692 killed and 1738 wounded.* Of the 1773 sick admitted to divisional medical units during approximately the same period (5 December - 1 January), 484 were cases of exhaustion.† These, though classified as sick, in need of psychiatric rather than surgical treatment, were really battle casualties inflicted by intense strain instead of enemy weapons.

Despite the heavy casualties, all medical units were not fully committed during December. The Canadian front was relatively narrow and evacuation routes limited in number. Accommodation for medical installations in the forward area was extremely scarce, due partly at least to the reservation of many buildings for future occupancy by Corps and Army Headquarters.

* These figures are exclusive of the killed and wounded in the 1st Canadian Special Service Battalion, which was in action during the period with the Fifth Army.

† W.D., A.D.M.S., 1 Cdn Inf Div, April 1944: Appx 26, Quarterly Report, 1 December 1943 - 31 March 1944.

In any case a reserve of some kind was essential, as a precaution against just such unforeseeable events as the washing out of the Sangro bridges on the night of 4-5 December. These same factors would appear to explain also why the bulk of the forward surgery was done at advanced dressing stations.

On 4 December, by which time the Canadians had assumed full responsibility of the coastal flank, No. 5 Field Ambulance established a casualty collecting post at San Vito Chietino and an advanced dressing station, with one Canadian and one British field surgical unit and the Canadian field transfusion unit attached, at Rocca San Giovanni. Loss of the Sangro bridges temporarily blocked the forward movement of further medical units. Although by 8 December No. 1 Field Dressing Station and No. 4 Field Ambulance had crossed the Sangro, the latter even establishing a casualty collecting post across the Feltrino River in front of San Vito, No. 5 Field Ambulance nevertheless carried most of the casualty load until the 11th. In the interval No. 2 Field Surgical Unit relieved its British counterpart at the advanced dressing station in Rocca. The heavy burden imposed upon the latter unit was somewhat relieved by the addition of 12 nursing orderlies from No. 1 Field Dressing Station to assist in the care of post-operative patients.

The advanced dressing station at Rocca admitted over 900 British and Canadian casualties of all types up to the end of 10 December. On the 9th alone admissions totalled 230. All but a very few, these mainly post-operative cases, were quickly evacuated south of the Sangro, chiefly to a British casualty clearing station at Vasto. When the bridges were washed out, a detachment from No. 5 Field Ambulance set up a beach evacuation centre at Fossacesia Station on the coast. From here, on their return journeys, the DUKWs (2½ ton amphibious trucks) that had been pressed into service to maintain the Division over this crucial period carried casualties by sea to Casalbordino Station further down the coast, whence they were transferred to Vasto by motor ambulance convoy. This mode of evacuation was not finally discontinued until 11 December, since traffic conditions did not permit complete reliance of road evacuation for some days after the Sangro bridges were restored.

On the 11th by which date 'the battle of the Gully' had begun, there was a general shift forward of medical installations. No. 4 Field Ambulance opened an advanced dressing station at San Vito in place of No. 5's casualty collecting post. The latter was moved simultaneously to Sant Apollinare, overlooking the battlefield from the south bank of the Moro. No. 1 Field Dressing Station, left at Fossacesia since 8 December to look after patients taken over from the British, arrived at Rocca to relieve No. 5 Field Ambulance. With these changes effected, the casualty collecting posts began to evacuate to San Vito instead of Rocca.

The school building housing the advanced dressing station at San Vito, though pitted with many shell holes and lacking glass in many of the windows, had adequate cover for nearly 100 patients. But as the town was still subject



WHOLE BLOOD FOR THE FRONT

Supplies of whole blood are drawn from the refrigerator unit of an R.C.A.M.C. truck at No. 1 Field Transfusion Unit, San Vito Chietino, Italy, 11 January 1944.

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to enemy shelling, the A.D.M.S. directed that for the time being casualties would not be retained there longer than absolutely necessary. Until 16 December all casualties arriving at San Vito were transferred elsewhere as rapidly as possible: Priority I and II cases, those requiring resuscitation and/ or urgent surgery, to the advanced surgical centre at Rocca, now based on No. 1 Field Dressing Station; Priority III, all other casualties, to Vasto; seriously sick to a British field ambulance at Cupello; minor sick to No. 2 Light Field Ambulance at San Vito Marina; exhaustion cases to a treatment centre established in Rocca by the divisional psychiatrist in conjunction with first the field ambulance and then the field dressing station.

By the 16th, with the discharge of cases somewhat slower than the intake, the number of patients held by No. 1 Field Dressing Station was rapidly -approaching the maximum capacity of the wards. On that date, although San Vito was not yet entirely safe from enemy artillery, No. 2 Field Surgical Unit and No. 1 Field Transfusion Unit were attached to the advanced dressing station. No. 1 Field Surgical Unit joined them on the 19th, whereupon No. 1 Field Dressing Station ceased completely to admit any but exhaustion and venereal disease cases. Four British nursing sisters had arrived meanwhile at the field dressing station to assist in the care of the numerous post-operative patients. Their presence at this unit, it may be noted, established a precedent in the R.C.A.M.C.

As a result of these, and other less important changes, the Canadian medical situation on 19 December, the day which saw the end of German resistance in the Gully, was as follows. The most forward casualty collecting post was at San Leonardo across the Moro, manned by a company of No. 9 Field Ambulance. It was extremely busy and under frequent shellfire. No. 5 Field Ambulance was at Sant' Apollinare, one company operating a relatively inactive casualty collecting post, the balance of the unit on wheels waiting to move into Ortona. Resuscitation and urgent surgery as well as triage were being done at No. 4 Field Ambulance's advanced dressing station at San Vito, to which a number of nursing orderlies had been attached from No. 2 Field Dressing Station. The destinations of Priority III casualties and sick evacuated beyond San Vito remained unchanged. No. 9 Field Ambulance, except for the company at San Leonardo, was still in reserve. So also was No. 2 Field Dressing Station, now located on wheels near Rocca after a period of duty at Casalbordino, where it had been left to look after a number of British post-operative cases.

Due to the extended battle for Ortona itself, Canadian medical dispositions remained virtually unchanged for the next week, though casualty collecting posts were moved forward with the attacking brigades. No. 5 Field Ambulance prepared to open an advanced dressing station at Sant'Apollinare, but was in almost daily expectation of moving into Ortona. No. 2 Field Dressing Station occupied buildings in Sant' Apollinare with a capacity of 80 patients, but also remained closed.

On 26 December, with Ortona still not in Canadian hands, the medical situation had to be reconsidered. Since the 19th the advanced dressing station/advanced surgical centre at San Vito had handled over 700 casualties of all types. On the 26th there were a further 145 admissions, but only 120 evacuations. This brought the total number of surgical and medical cases retained to 98, almost the limit of the installation's capacity. No. 5 Field Ambulance was therefore ordered to open at Sant' Apollinare to relieve No. 4 of responsibility for triage. The latter continued to form the basis of the advanced surgical centre, and thus to receive all resuscitation and urgent surgical cases. The more serious Priority III cases were sent from Sant' Apollinare to the British casualty clearing station at Rocca, the rest to Vasto. The lines of evacuation for non-battle casualties were left as they were, except that No. 2 Field Dressing Station now opened at Sant' Apollinare to receive a proportion of the minor sick.

When on 29 December No. 5 Field Ambulance was finally able to establish an advanced dressing station in Ortona, no immediate change was made in these latest arrangements, the ambulance cars of a British motor ambulance convoy being supplemented as required by field ambulance transport in order to make up for the increased distances to be travelled. The offensive on this sector of the front was now approaching a stalemate. By 4 January a few miles had been gained to the north and west of Ortona, but it had become clear that the Division required a period of rest before undertaking another major effort. This fact, coupled with the necessity of vacating the buildings occupied by Canadian medical units in Rocca and Sant' Apollinare, caused the A.D.M.S. early in January once again to make some alterations.

The changes centred chiefly about San Vito, where the departure of 5th Corps Headquarters about 3 January eased the accommodation problem. No. 1 Field Dressing Station closed at Rocca, transferring its patients to No. 4 Field Ambulance. The latter was relieved of its responsibilities as parent unit to the field surgical and field transfusion units by No. 2 Field Dressing Station and moved to other quarters in the town to look after minor sick, exhaustion, and venereal disease cases; actual supervision of these special patients, as at No. 1 Field Dressing Station, remained the responsibility respectively of the divisional psychiatrist and the divisional venereologist. Since 29 December two British nursing sisters had been reporting daily to the advanced surgical centre at San Vito to assist with the care of post-operative cases. They continued to render this extremely valuable service until relieved by Canadian nurses late in January. No. 5 Field Ambulance remained open in Ortona, the lines of evacuation from it running back to one or other of the two Canadian installations in San Vito, or to British units at Rocca, Casalbordino, or Vasto, depending on the type of casualty. No. 2 Light Field Ambulance continued to hold minor sick to the limit of its capacity, evacuating battle casualties and seriously sick through



MEDICAL SCENES NEAR THE FRONT

A medical officer of the advanced dressing station of No. 4 Field Ambulance checks the condition of a wounded Canadian soldier before blood is given to him for his trip back to a field surgical unit, 12 January 1944. The advanced dressing station was located on the ground floor, in this case the stable, of a house about a mile and a half south-west of Ortona. On the accompanying page is shown an exterior view of the advanced dressing station of No. 4 Field Ambulance, 12 January 1944. An ambulance stands by ready to transport patients to a field surgical unit.



An advanced dressing station of No. 4 Field Ambulance, 12 January 1944.

No. 2 Field Dressing Station. No. 1 Field Dressing Station and No. 9 Field Ambulance were stationed in Ortona as a mobile reserve. With a few modifications consequent upon the appearance of the 1st Canadian Corps in the line at the beginning of February, these arrangements were to suffice the 1st Division in the Ortona salient for the balance of the winter.

The 1st Canadian Corps

Headquarters, 1st Canadian Corps, the 5th Canadian Armoured Division, and a considerable body of Corps Troops arrived in the theatre in November 1943. The armoured division, including No. 24 Field Ambulance, No. 7 Light Field Ambulance, No. 13 Field Dressing Station, and No. 13 Field Hygiene Section, disembarked at Naples and proceeded immediately to a concentration area on the southeast edge of the Foggia plain in the general area of Gravina, Altamura, and Matera. Headquarters and the Corps Troops were directed temporarily to Sicily. Among the latter, which included a proportional allotment of what were normally classed as Army, G.H.Q., or L. of C. Units, were Nos. 4 and 5 Casualty Clearing Stations, Nos. 3, 8, and 16 Field Dressing Stations, Nos. 2 and 3 Field Transfusion Units, Nos. 3 and 4 Field Surgical Units, No. 5 Field Hygiene Section, No. 1 Mobile Hygiene Laboratory, No. 1 Mobile Bacteriological Laboratory, and No. 1 Advanced Depot Medical Stores. No. 1 Motor Ambulance Convoy was also available to the D.D.M.S. for operational purposes.

Medical arrangements in the 5th Armoured Division's concentration area require little elaboration. No. 24 Field Ambulance opened in a former Italian military hospital at Altamura, where it was able to accommodate approximately 80 patients. It served the 1st Infantry Brigade and a few divisional troops. No. 7 Light Field Ambulance opened a similar establishment of 40 beds at Matera for the benefit of the 5th Armoured Brigade. The bulk of the divisional troops were served by No. 13 Field Dressing Station at Gravina, where 60 beds were maintained. As a matter of policy only patients unlikely to recover within two weeks or in need of treatment by a specialist were evacuated to No. 1 General Hospital, which opened at Andria on 1 December. Approximately 50 per cent of all sick and accident cases were treated within the Division and returned directly to their units.

It had been arranged that the 5th Canadian would take over the equipment and vehicles of the 7th British Armoured Division. But this formation had seen much service. There were deficiencies in both expendable and non-expendable medical stores. Much of the medical equipment actually acquired was in various stages of disrepair and could not be depended upon to carry through any lengthy action, though this was partly balanced by a smattering of captured Italian and German equipment in reasonably

good condition. The medical transport was "a heterogeneous mixture of almost every known make",* and many vehicles required major repairs. The bulk of the ambulance cars were two-wheeled drive Austins, unsuited for any but hard-surfaced roads. No. 13 Field Dressing Station, having no counterpart in the British formation, had to draw its medical supplies and equipment from a British general hospital and its vehicles from whatever sources could be found. Strenuous efforts were made to repair or replace damaged equipment and to obtain the items that were missing. There was a general reshuffling of the vehicles available, so that the best value might be obtained from each. Although jeeps were in short supply, the A.D.M.S. managed to have a few placed at his disposal. By the time the 5th Armoured Division was called into battle, its medical units were adequately, though not ideally equipped to handle all types of casualties in the field.

The experience of the Corps medical units was similar. The D.D.M.S. preceded them to Sicily and arranged that the larger units should be distributed to serve all Corps Troops. The casualty clearing stations accordingly opened No. 4 at Catania, No. 5 at Messina; Nos. 3 and 8 Field Dressing Stations did likewise at Lentini and Taormina. From the Canadian units in their vicinity, they received all sick and injured, evacuating the most serious cases to No. 5 General Hospital at Catania, or to British hospitals situated at Syracuse and Messina. They had no responsibility for casualties from Italy, Canadian or otherwise, or, except in an emergency, for non-Canadian casualties in Sicily, but the British hospital at Messina was reinforced by surgeons, nurses, and medical orderlies from No. 5 Casualty Clearing Station.

The smaller Corps medical units proceeded to the mainland at an early date. Once sufficiently equipped, they were assigned temporary tasks under the direction of the A.D.M.S., Canadian Section G.H.Q. 1st Echelon. No. 3 Field Surgical Unit and Nos. 2 and 3 Field Transfusion Units, for example, were attached to a British casualty clearing station then serving in the Fifth Army with the 10th British Corps.

Early in December No. 3 Field Dressing Station was sent to Avellino, to function as a small hospital for the benefit of the Canadian administrative and reinforcement units in that area. To it were promptly attached No. 4 Field Surgical Unit, the mobile laboratories, and a number of reinforcement nursing sisters. About the same time, No. 4 Casualty Clearing Station also proceeded to the mainland. On 17 December, temporarily under British control, it relieved a British casualty clearing station at Torre Maggiore.

The turn of the year found the remaining Corps medical units preparing to move with the other Corps Troops to a concentration area near that of the 5th Armoured Division. Though patients on hand presented the usual problems, the migration proceeded with almost surprising smoothness. By

* 11 /AAI 5 Div./1 : Quarterly Report, A.D.M.S., 5 Cdn Armed Div, 1 December 1943 - 31 March 1944.

19 January all three were functioning in previously selected locations in the vicinity of Bari: No. 5 Casualty Clearing Station at Corato; No. 8 Field Dressing Station at Marietta; No. 16 Field Dressing Station at Toritto.

By this date, too, the problem of equipping the Corps medical units had largely been solved. It seemed to the D.D.M.S. when he first arrived in Sicily that contrary to expectations the equipment situation was rather unpromising, the more so because No. 1 Canadian Advance Depot Medical Stores and several of the other small medical units had lost most of their stocks by enemy action en route; he "regretted having left so much excellent equipment in England".* But this view proved unduly pessimistic. No. 4 Casualty Clearing Station took over the complete ordnance and medical equipment of the unit it relieved at Torre Maggiore. Ordnance equipment for No. 5 Casualty Clearing Station, Nos. 8 and 16 Field Dressing Stations, and No. 5 Field Hygiene Section, shipped in bulk from the United Kingdom consigned to units, arrived safely, while No. 3 Field Dressing Station was supplied from Canadian ordnance bulk stores in the theatre. Most of their medical equipment was obtained from a British advanced depot medical stores at Catania, though No. 5 Casualty Clearing Station was still lacking a number of items when it moved to Italy and had subsequently to draw on various sources of supply there. The field surgical and field transfusion units and the mobile laboratories were similarly equipped, or re-equipped, with varying amounts of difficulty.

The Ortona Salient, January - April 1944

Since the end of December, the Canadian operational picture had altered very little. Now, in the middle of January, the 11th Infantry Brigade of the 5th Armoured Division was ordered to relieve the 3rd Brigade on the right flank of the Ortona salient. With these fresh troops it was hoped to push the enemy back to the Arielli Valley. But the attack launched on 17 January was unsuccessful. The 11th Brigade was then withdrawn as previously arranged, its casualties being 61 killed and 102 wounded. The latter were evacuated through No. 24 Field Ambulance, especially sited in Ortona for this purpose.

Proceeding to the Lanciano area on the Orsogna front, the 11th Brigade came temporarily under the command of the 4th Indian Division as part of the 13th Corps. The balance of the 5th Armoured Division had meanwhile been put in motion, and on the night of 31 January-1 February its headquarters relieved that of the 4th Indian Division. That same night, Headquarters, 1st Canadian Corps, took over from Headquarters, 5th British Corps, with the 1st Canadian and 8th Indian Divisions under com-

* 11 /AAI 1 Corps/1 : Quarterly Report, D.D.M.S., 1 Cdn Corps, 8 November 1943 - 31 March 1944.

mand. When on 9 February the 5th Canadian Armoured exchanged positions with the 8th Indian Division, the process of introducing the 1st Canadian Corps into the line was finally completed.

During the five weeks that the 1st Corps functioned as such on the Ortona front, there were no important operational developments, offensive action being limited in the main to patrolling. But casualties were by no means lacking. Contrary to the popular conception, patrolling is not synon-ymous with inactivity. It is a grim and sometimes a desperate business, frequently resulting in small but deadly battles. Such engagements, enemy artillery and mortars, and atrocious weather all took their toll. Canadian battle casualties in the Corps from 1 February to 7 March were approximately 120 killed and 585 wounded. From 29 February to 4 March, 3466 Canadian sick and injured were admitted to divisional and corps medical units.* Uneventful as it was from the operational standpoint, this period in the line enabled the D.D.M.S. to obtain a reasonably clear picture of the capabilities, limitations, and general efficiency of the units that had now to be welded into a smoothly functioning Corps medical service.

For the 1st Division, No. 5 Field Ambulance remained open in Ortona, assisted as required by No. 9. The advanced surgical centre in San Vito continued to be based on No. 2 Field Dressing Station until 22 February, when it was temporarily closed. At the end of the month it was re-opened under Corps control by No. 8 Field Dressing Station. Early in February the treatment centre operated in San Vito by No. 4 Field Ambulance for minor sick, exhaustion, and venereal disease cases became a Corps medical centre.

Medical activity in the 5th Armoured Division centred about Lanciano. No. 24 Field Ambulance established an advanced dressing station there when the 11th Brigade came under command of the 4th Indian Division during the latter part of January. Upon the relief of the 4th Indian Division, an Indian advanced surgical centre at Lanciano was taken over by No. 13 Field Dressing Station, the British field surgical and field transfusion units remaining to work with it. When the 5th Canadian Armoured exchanged places with the 8th Indian Division, the Canadian medical installations in Lanciano were not required to move. No. 7 Light Field Ambulance then opened an advanced dressing station at San Vito to serve the 5th Armoured Brigade. It was located in the buildings left vacant on 10 February by the departure of No. 2 Light Field Ambulance with the 1st Armoured Brigade to join the 13th British Corps.

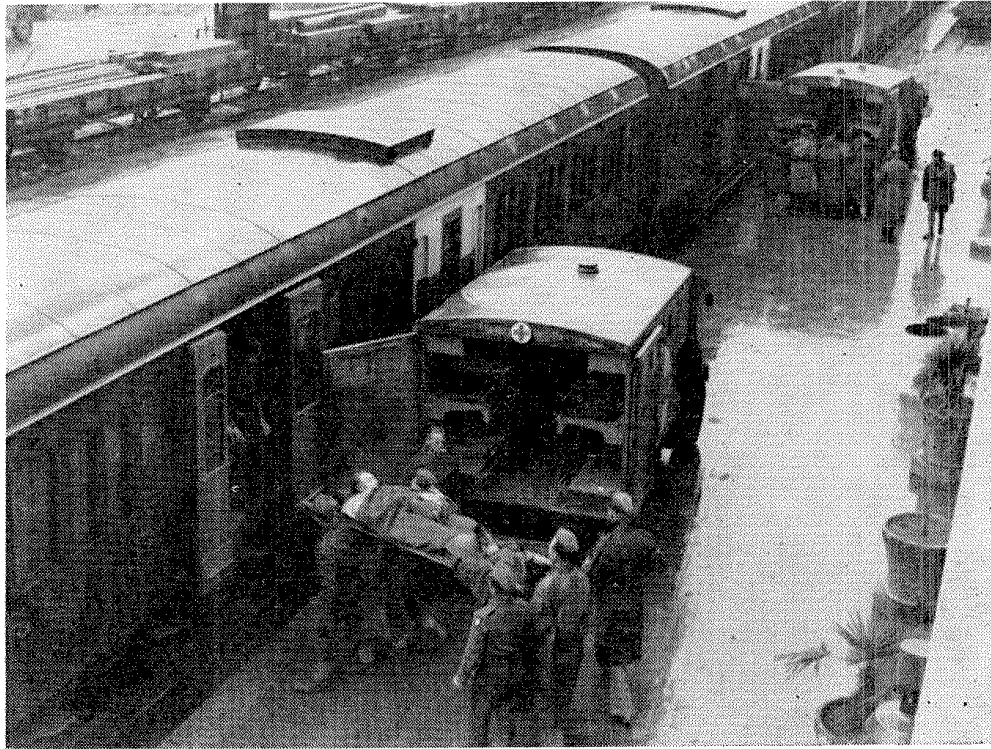
In the Corps the medical picture changed but slowly. Since there were more Canadian than British units, only a partial direct relief on a unit for unit basis was possible. No. 3 Field Dressing Station, the field surgical and field transfusion units, and the two mobile laboratories had to be recalled

* *Ibid.*



CASUALTY EVACUATION IN THE ORTONA AREA, ITALY

An unconscious patient receives blood plasma during the trip to a field surgical unit, 15 January 1944. Accompanying him and watching the treatment is an ambulance orderly.



LOADING A HOSPITAL TRAIN

The Allies made great use of hospital trains in casualty evacuation in Italy and North-West Europe. The trains were marked with red crosses on a white background, both on the sides and the tops of the coaches, in order that enemy aircraft could not fail to identify them. Casualties are shown here being loaded into a hospital train in the Barletta-Andria area, Italy, February, 1944.

from their temporary duties on the west coast. In any case the siting of medical units continued to be dictated by the availability of accommodation.

In the latter part of January No. 4 Casualty Clearing Station had moved from Torre Maggiore to Vasto. On 3 February No. 16 Field Dressing Station relieved a British field ambulance at Casalbordino. At about the same time, No. 4 Field Ambulance was brought under command of the D.D.M.S. to operate a Corps medical centre in San Vito. To this centre the two mobile laboratories were eventually attached. The British casualty clearing station at Rocca continued to admit Canadians until the middle of February, when it reverted to army command. By this date No. 1 Canadian Motor Ambulance Convoy had assumed responsibility for the evacuation of all casualties beyond the division. A site for No. 5 Casualty Clearing Station was found at Lanciano, but it was the end of February before any casualties could be accepted there. The end of February also saw the advanced surgical centre at San Vito begin to function under Corps control. Finally, on 3 March, ambulance train service on alternate days was instituted from San Vito Marina in order to eliminate the long journey by ambulance car to Vasto, where No. 4 Casualty Clearing Station had been functioning as a railhead hospital.

These improved medical facilities were not long enjoyed. On 7 March the 5th Corps again assumed responsibility for the coastal flank of the Eighth Army, whereupon the Canadian formation, less the infantry division and a few miscellaneous units, was withdrawn into reserve. The Corps Troops settled down along the course of the Biferno River, principally about the towns of Larino and Casacalenda. The 5th Armoured proceeded south of the Fortore River to the general area of Casalnuova, Motta Montecorvino, and Lucera.

From the medical point of view the move south was without incident. No. 4 Field Ambulance reverted to divisional command. No. 8 Field Dressing Station was relieved by No. 1, thus re-establishing the advanced surgical centre at San Vito upon a divisional level. No. 5 Casualty Clearing Station at Lanciano was relieved by a British casualty clearing station. With ambulance train service from San Vito Marina, there was no difficulty in clearing either Corps medical units or those of the 5th Armoured Division.

In the new concentration area, No. 5 Casualty Clearing Station opened at Casacalenda for the benefit of Corps Troops. Further evacuation was by ambulance train, through a British general hospital at Termoli, to Andria, where No. 1 had by this time been reinforced by No. 5 General Hospital. No. 3 Field Dressing Station functioned similarly at Larino. Evacuation from the 5th Armoured Division was likewise by ambulance train, No. 16 Field Dressing Station at Sassi being used as a staging centre for casualties en route to Termoli. Minor cases with a recovery expectancy of ten days or less were held in one or other of the divisional medical units: No. 13 Field Dressing Station (40 beds) at Pietra; No. 7 Light Field Ambulance (50 beds)

at Castelnuova; No. 24 Field Ambulance (70 beds) at Casalnuova. Emergency surgical or medical cases were admitted to a United States field hospital at San Severo.

The 1st Division remained in the Ortona salient until 21 April. From the casualty collecting posts all casualties were cleared to the advanced dressing station in Ortona, where No. 5 Field Ambulance by this time had accommodation for 60 patients. Priority I and II cases were forwarded directly to the advanced surgical centre at San Vito, while those of Priority III were evacuated by No. 1 Motor Ambulance Convoy normally to the British casualty clearing station at Lanciano but if necessary to No. 4 Casualty Clearing Station at Vasto. An ambulance train left every second morning from San Vito Marina, clearing patients directly from the forward installations to the Canadian hospitals at Andria by virtue of British co-operation in detraining them at Barletta and sending them on by motor ambulance convoy. Minor sick, exhaustion, and venereal disease cases were treated as before by No. 4 Field Ambulance at San Vito.

Canadian Hospitals in Italy, November 1943 - March 1944

Although at the end of November 1943 the forward movement of Nos. 5 and 15 General Hospitals from their respective locations in Sicily and North Africa was only in the planning stage, Nos. 1 and 14 General Hospitals had already reached Italy, arriving directly from the United Kingdom among the L. of C. Troops allotted to the Mediterranean Theatre in support of the 1st Canadian Corps.

No. 1 opened at Andria on 1 December. The accommodation consisted of three separate buildings, two of them close together on the outskirts, the third about half a mile away towards the centre of the town. The main building was a modern two storey Italian civil hospital, the other two were schools. The only serious drawback to the site as a whole was the inadequacy by Canadian standards of the plumbing facilities, a defect rectified in due course by British engineers.

No. 14 was almost lost en route to Italy aboard the *Santa Elena*, for the ship was so badly damaged by enemy air action off Philippeville that it had to be abandoned. Happily most of the personnel aboard were picked up from lifeboats and rafts by other ships in the convoy, without loss of life among the hospital staff. But all documents and personal equipment went down when the *Santa Elena* sank while being towed to port. Despite this inauspicious beginning, No. 14 was able to open at Caserta on 5 December, its ordnance and medical equipment having arrived safely by cargo ship. The site was a former Italian barracks comprising eight large buildings. One side was occupied by the Canadian unit, the other by an American evacuation hospital.



NO. 1 GENERAL HOSPITAL, ANDRIA, ITALY

A view of one of the wards, 8 February 1944. The slogan, "Credere, Obbedire, Combattere" ("Believe, Obey, Fight"), remains on one of the walls, a reminder of the departed fascist regime. The unit was set up in three buildings formerly housing a civilian hospital and two schools.

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From their opening until the end of January 1944, Nos. 1 and 14 bore the brunt of the Canadian hospital work, and the number of beds occupied was generally in excess of their theoretical capacities. No. 1, though only a 600-bed unit, had over 800 beds continually in operation at Andria from 10 December onward. As a line of communications hospital, it also had a rapid turnover of patients. During December there were 2143 admissions and 1396 discharges or transfers, In January discharges or transfers totaled 1963 against a total of 2031 admissions. The bulk of these were Canadians, received either from the Ortona front or from the concentration areas of the 5th Canadian Armoured Division and Corps Troops. Every second day, by ambulance car convoy and ambulance train, patients varying in number from 80 to 160 were cleared from Andria, Canadians to No. 14 General Hospital. The latter also received a considerable number of British from the Fifth Army front. On 19 December, for example, 250 British patients had to be transferred to a British hospital to make room for Canadians arriving from Andria. On 21 January 182 British were transferred against 214 Canadians received. Altogether No. 14 was extremely busy, especially since many Canadians had to be held pending evacuation by hospital ship to the United Kingdom. A 1200-bed unit, it had over 1400 patients on 23 January, though the situation was eased a few days later when the *Lady Nelson* evacuated some 260 of these.

No. 5 General Hospital opened on 4 February as a tented hospital at Andria, in proximity to No. 1. It did not proceed to Avellino as originally intended because No. 3, a 200-bed hospital, had recently arrived from the United Kingdom to serve the Canadian base reinforcement group. It was allotted the accommodation at Avellino previously earmarked for No. 5, opening there on 5 February. The following day No. 15 General Hospital opened at Caserta, having taken over that portion of the barracks previously occupied by the American hospital.

Instructions were now issued to all concerned that whenever possible Canadian casualties would be admitted or transferred to Canadian hospitals. Policy as to the function of each of the four large hospitals was laid down in a formal directive on 1 February:

Canadian battle casualties and sick will, in the main, be admitted in the first instance to the Andria group of Canadian hospitals. They will be transferred, if necessary, from the Andria group to the Caserta group by ambulance train. The Caserta group of hospitals will be considered to be the Canadian base for purposes of evacuation to the U.K. and for the treatment of casualties who require long term treatment in this theatre. . .*

This policy, which for all practical purposes was the one pursued since December, remained unchanged in essential until the participation of the 1st Canadian Corps in the battles of the Liri Valley necessitated a redistribution

* W.D., Cdn Sec G.H.Q. 1 Ech, February 1944: Appx 29, Medical Administrative Letter No. 5, 1 February.

of hospitals. Generally speaking, Nos. 1 and 5 at Andria retained only those casualties requiring a period of treatment not in excess of 14 days. All venereal diseases and neuropsychiatric cases were cleared as soon as possible to Caserta, the latter to a base neuropsychiatric centre at No. 14 and the former to a venereal disease wing at No. 15. All casualties who could not be expected to recover within 90 days were evacuated to the United Kingdom. Convalescent patients from Caserta were dispatched to No. 1 Convalescent Depot, now located at Mercatello, just south of Salerno on the west coast. To meet the needs of convalescents from the Andria hospital group, a second division (1000 beds) of the convalescent depot was authorized and placed under the administrative control of a British convalescent depot at Trani on the Adriatic coast, some ten or eleven miles from Andria. Canadian Military Headquarters had been requested to provide a second convalescent depot completely separate from the one already in the theatre but had refused because of the manpower considerations involved.

By the end of February 1944 Canadian Military Headquarters had also decided against sending another 600-bed general hospital to Italy. When the D.M.S. recommended early in December that one should be sent, the proposal was favourably received in London. But the senior Canadian administrative officer in Italy, Brigadier A. W. Beament, contended that there was no Canadian requirement for an additional 600-bed hospital. Although agreeing that a theatre requirement existed for another hospital of this size, he argued that it would be more logical first to add a 300-bed increment to each of Nos. 14 and 15 General Hospitals, since the accommodation allotted to them permitted such an expansion. The D.M.S. promptly pointed out that general hospitals could function at full capacity for long periods only to the detriment of both staff and patients, and that with a spare 600-bed unit in the United Kingdom (No. 11) it seemed only sensible to send it out, especially as the whole allied force in Italy was under-hospitalized. The decision reached at Canadian Military Headquarters was that the Italian theatre could have either the extra hospital or the two 300-bed increments, but not both. Brigadier Beament decided to have the increments, which were duly authorized. An effort by the D.M.S. in February to have this decision reversed floundered on the official argument that with 4400 Canadian hospital beds available in Italy, representing roughly 6 per cent of the Canadian force, purely Canadian requirements had been adequately met; this despite medical opinion in the theatre that another 600-bed hospital was very desirable if not essential.* In April an additional 2000 Canadian hospital beds over and above Canadian requirements were earmarked as a contribution to the 21st Army Group's prospective requirements in North-West Europe, thus finally ending all prospect of reinforcing the hospitals in the Mediterranean theatre.

* All the documents relevant to this issue are to be found on 1 /Hospital/1/2. Brigadier Beament at the time was Officer in Charge, Canadian Section, G.H.Q. 1st Echelon, 15 Army Group.



REMEDIAL TREATMENT DURING CONVALESCENCE

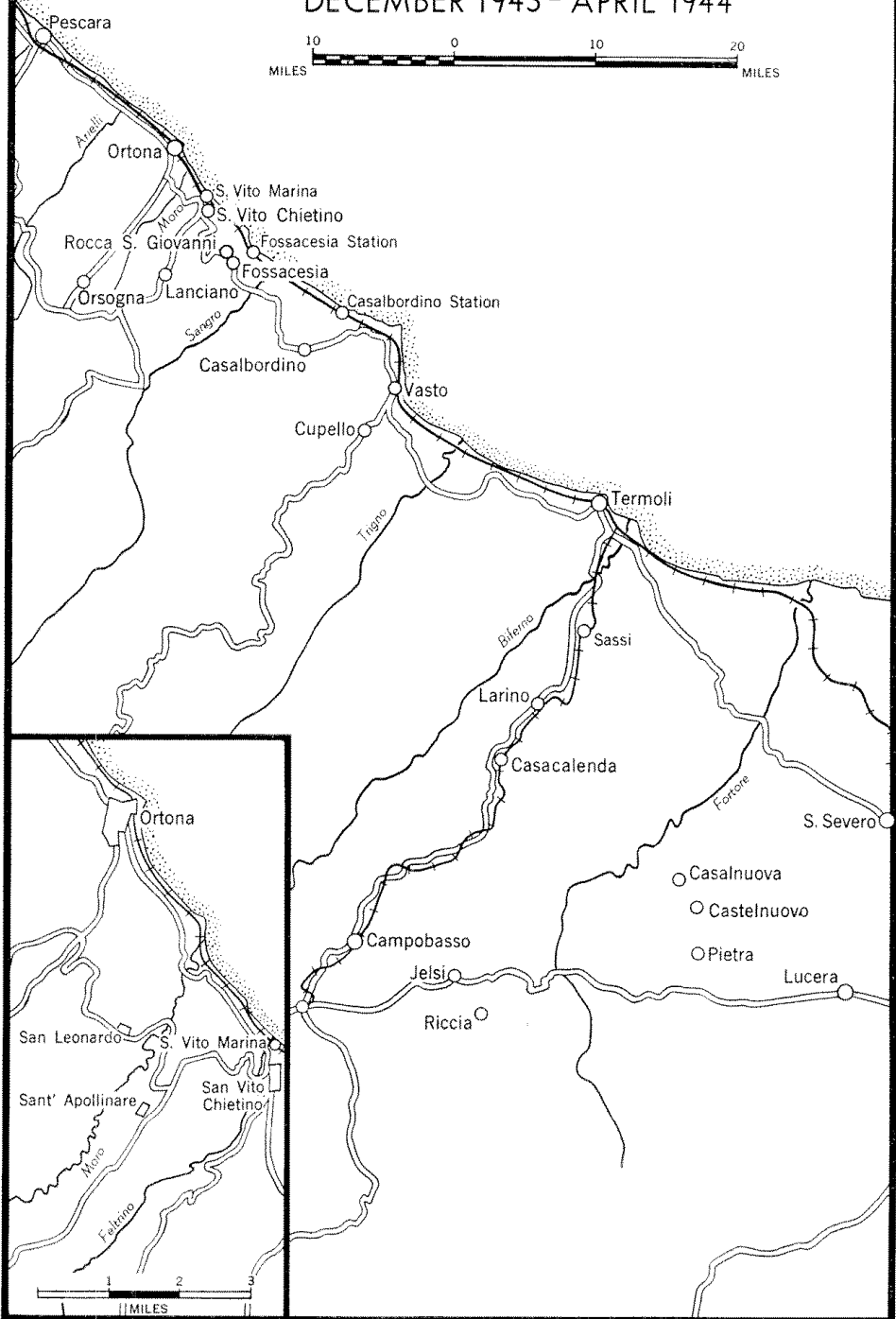
The rehabilitation of casualties was an important aspect of medical activity. These photographs show some features of this work at No. 1 Convalescent Depot, Mercatello, Italy, 25 February 1944. Soldiers here walk through tent lines to help strengthen muscles weakened by long hospitalization or injury. In the below photograph soldiers are seen exercising back and shoulder muscles with weights attached to pulleys.



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THE ADRIATIC SECTOR

DECEMBER 1943 - APRIL 1944



Compiled and Drawn by Historical Section, G.S.

It remains to note the fate of a proposal to provide a Canadian ambulance train in Italy. The whole allied force was heavily dependent on this mode of casualty evacuation. It seemed reasonable to the Canadian authorities in Italy that they should staff at least one train, particularly since the British manpower situation was becoming very difficult. When the question was referred to Canadian Military Headquarters in December 1943, the answer was brief and to the point:

Ambulance train British L. of C. responsibility. No provision exists under which this can be supplied Canadian resources. Not approved. . .*

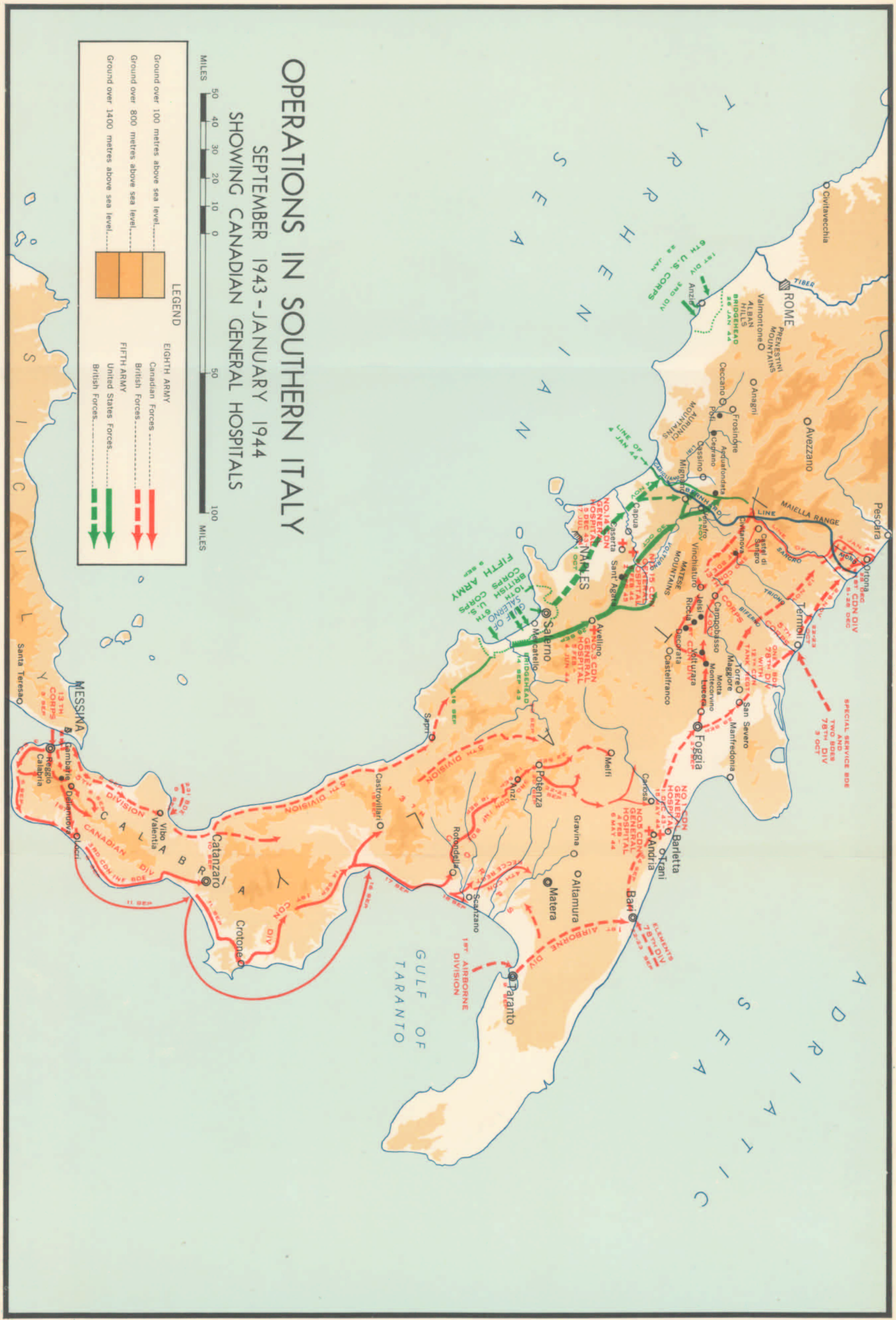
* 1 /Hospital/1 /2: Tel. G.S. 3181, Canmilitary to Flambo for Candex, 19 December 1943.

OPERATIONS IN SOUTHERN ITALY SEPTEMBER 1943 - JANUARY 1944 SHOWING CANADIAN GENERAL HOSPITALS

LEGEND

Ground over 100 metres above sea level.....
 Ground over 800 metres above sea level.....
 Ground over 1400 metres above sea level.....

EIGHTH ARMY
 Canadian Forces
 British Forces
FIFTH ARMY
 United States Forces.....
 British Forces.....



Reproduced by Army Survey Establishment, R.C.E.

Compiled and drawn for Historical Section G.S.

The Liri Valley

Allied fortunes in Italy did not prosper greatly during the winter campaign of 1943-44. The capture of Ortona marked the virtual end of the Eighth Army offensive towards Pescara and Avezzano that was to have threatened in flank the German forces defending Rome. West of the Apennines, persistent and heavy attacks by the Fifth Army during January and February failed equally to open a road to the Capital. Holding firmly along the Gustav Line, which was anchored on Cassino and followed generally the courses of the Rapido, Gari, and Garigliano Rivers, the Germans withstood all attempts to reach Rome along the inviting avenue of the Liri and Sacco Valleys. The amphibious assault at Anzio on 22 January failed in its purpose of outflanking this line of defence, for despite the initial surprise achieved, the bridgehead was quickly contained.

By the end of February it had become clear that nothing less than an all-out spring offensive would suffice to clear the enemy from his tenaciously held positions. "General Alexander's intention was to continue to enlarge the Anzio bridgehead and to strike at Cassino once more, while at the same time redispersing his armies to the west of the Apennines for a full-scale attack through the Liri Valley which would link up with a projected breakout from Anzio and give us Rome".*

The necessary regrouping began at the end of March but was not finally completed until the early part of May. The Eighth Army then had a striking force comprising the 13th British, the 2nd Polish, and the 1st Canadian Corps concentrated opposite the mouth of the Liri Valley. To the east, the line was thinly projected to the Adriatic by the 10th and 5th British Corps. To the west, between the Liri River and the Tyrrhenian Sea, the Fifth Army held a reduced front with the 2nd United States Corps and the Corps Expditionnaire Fran ais.

In rear of the Gustav Line the Germans had constructed a second line of defence, the Hitler Line. The task of the Eighth Army was to pierce both positions and then advance along the general axis of Highway No. 6 which followed roughly the northern side of the Liri and Sacco Valleys from Cassino through Ceprano and Frosinone to Rome.

Preparatory Phase

The 1st Canadian Corps began to leave the Adriatic sector during the first half of April. Corps Troops proceeded to the Volturno Valley about Telesse and S. Salvatore, the 5th Armoured Division to the vicinity of S. Agata

* Stacey, Colonel C.P., *The Canadian Army 1939-1945*, p. 130.

and Melizzano east of Caserta. When on 21 April the 1st Infantry Division finally withdrew from the Ortona salient, it moved by stages to a concentration area in the familiar territory about Campobasso and Vinchiaturu. No. 5 Casualty Clearing Station opened at "Grand Hotel", Telesse, as the basis of a Corps medical centre, while Nos. 2 and 13 Field Dressing Stations functioned in a similar capacity in the divisional concentration areas. The only point of special interest about medical arrangements during April is that No. 24 Field Ambulance accompanied the 11th Infantry Brigade to the mountainous country north-east of Cassino, where the brigade held a sector of the front from 12 April to 5 May under command successively of the 4th British and 2nd New Zealand Divisions.

Final preparations for the offensive involved a further move by the various components of the Corps, this time to assembly areas, which was accomplished during the first week of May. Corps Troops were disposed along Highway No. 6 southward of Vairano, the 5th Armoured east of the highway to the north of Capua, the 1st Infantry east of Caserta in the area vacated by the armour. The Corps medical units were all in a single camp, with No. 4 Casualty Clearing Station and the light sections of Nos. 3 and 8 Field Dressing Stations open. The divisional units were with their own formations, the minimum possible number open for minor sick, No. 1 Research Laboratory arrived in the Corps Troops assembly area on 6 May, followed by No. 3 General Hospital (200 beds) on the 11th. With the four large general hospitals by this date grouped in a rough semi-circle to the North-east of Naples, No. 1 at Avellino, No. 5 at Cancellu, Nos. 14 and 15 still at Caserta, the R.C.A.M.C.'s stage-setting for the battle was complete.

The Offensive

The attack on the Gustav Line was opened on the night of 11-12 May by the 13th British and the 2nd Polish Corps. By the end of 15 May the 8th Indian Division, with the support of the 1st Canadian Armoured Brigade, had secured a substantial bridgehead over the Gari River on the extreme left of the British front. The 1st Canadian Corps, headed by the 1st Division, passed through the Indians to take its part in the fray. By the afternoon of the 18th the leading elements had fought their way to within about a mile of the Pontecorvo-Aquino road, which along the floor of the valley marked the main defences of the Hitler Line. The joint efforts of British and Poles had by this time secured Cassino, while on the left the Germans were continuing to fall back before the fierce thrusts of the Fifth Army. When on 19 May British and Canadian attempts to rush the Hitler Line failed, preparations were immediately begun for a full-scale assault.

This was carried out by the 1st Canadian Corps on 23 May with complete success, though with heavy casualties. The 1st Division, attacking on a two-brigade front, broke through the line by nightfall despite the inability

of the 2nd Brigade on the right to make headway. The 5th Division was launched through the gap towards the Melfa River. This next obstacle proved most troublesome in the face of continuing resistance, but by mid-day on the 25th a sufficiently firm bridgehead had been secured to permit of bridges being thrown across for the passage of the armoured regiments. Downstream from these crossings, a special pursuit force from the 1st Division had also succeeded in establishing a bridgehead.

Beyond the Melfa the battle became a pursuit. On 25 May the troops from Anzio linked up with those of the Fifth Army to threaten the enemy's escape routes through Rome. As a result, the Germans became chiefly concerned with evacuating the Liri Valley as quickly as possible, even though continuing to impose delays on the advance of the Eighth Army. The 5th Armoured Division reached Ceprano on 27 May, and was then directed on Frosinone. On the 29th both its brigades arrived within about five miles of this new objective, Pofi being captured that night. On 30 May the 1st Division took over the pursuit, entered Frosinone the following day, and by 4 June had reached the Anagni area. On that date the 1st Canadian Corps was withdrawn into reserve. With three corps of the Fifth Army converging on Rome there was no room for those of the Eighth on the available roads.

The first stage of the Canadian medical plan for the offensive was put into effect as soon as the attack on the Gustav Line was launched, for although the 1st Canadian Corps itself was in reserve, the 1st Armoured Brigade and the 1st Army Group Royal Canadian Artillery were active participants. For the moment there was no forward movement of medical units. In the Corps Troops assembly area No. 4 Casualty Clearing Station and No. 3 General Hospital opened for battle casualties, No. 8 Field Dressing Station for casual sick. The light sections of Nos. 3 and 8 Field Dressing Stations were employed, respectively, as a Corps venereal disease treatment centre and a Corps neuropsychiatric centre. Evacuation beyond the Corps by motor ambulance convoy and the allocation of patients to hospitals were supervised by means of an ambulance control post at Capua.

While the 1st Canadian was in the process of relieving the 8th Indian Division during 16 May, as the first step in introducing the 1st Corps into the battle line, the majority of Canadian battle casualties were cleared back across the Gari to No. 19 British Casualty Clearing Station at Presanzano. But when early on the 17th the 1st and 3rd Brigades attacked northward across the Pignataro — Cassino road, the Canadian lines of evacuation were fully organized and functioning satisfactorily. With casualty collecting posts on the west side of the Gari, Nos. 4 and 9 Field Ambulances had their advanced dressing stations close to the east bank. Further back in the divisional area, along Highway No. 6, No. 2 Field Dressing Station had established an advanced surgical centre for the reception of Priority I and II casualties in the vicinity of a crossroads popularly known as "Cox's Corner". Priority III casualties were being evacuated to No. 4 Casualty

Clearing Station in the assembly area south of Vairano, but No. 5 Casualty Clearing Station was already in the process of moving up to Mignano. The disposition of sick, including exhaustion and venereal disease cases, remained as before.

As the 1st Division fought its way towards the Hitler Line, advanced dressing stations were gradually established across the Gari and then moved forward as required to keep pace with the advance. On 18 May No. 5 Casualty Clearing Station opened at Mignano for Priority III cases. On the 19th No. 1 Field Dressing Station established an advanced surgical centre on the "down" route west of the Gari, and relieved No. 2 of the responsibility for Priority I and II casualties. The available roads and tracks were in extremely poor condition, congested with traffic, and in the forward area frequently under direct enemy fire. Inevitably there were delays in clearing regimental aid posts and casualty collecting posts, the time lag in some instances amounting to as much as six hours. By the end of the 19th, nevertheless, all brigade areas had been cleared of existing casualties.

On 20 May No. 4 Casualty Clearing Station opened at "Cox's Corner", close to No. 2 Field Dressing Station. Battle casualties, principally Priority III but also such Priority I and II cases as became transferable from the advanced surgical centres, were thereupon directed to both casualty clearing stations, 100 to each in rotation. As a further preparation for the attack on the Hitler Line, all field dressing stations, field surgical units, and field transfusion units were pooled on 22 May under the operational control of the D.D.M.S., who assumed responsibility for establishing successive advanced surgical centres along the "down" traffic route as the battle progressed. To ensure the success of this experiment Nos. 3 and 13 Field Dressing Stations were on that day moved up to positions close behind the 1st Division, each prepared either to open as an advanced surgical centre as soon as the attack was launched or to move further forward, whichever course events might dictate. No. 16, with a similar role, was positioned on wheels close beside the advanced surgical centre based on No. 1 Field Dressing Station, which for the time being continued to accept all Priority I and II casualties. No. 8 Field Dressing Station and No. 3 General Hospital remained in their original locations, the former to act as a clearing centre for sick, the latter to hold minor sick and short-term surgical cases.

Relieved of all responsibility for forward surgery, the A.D.M.S., 1st Canadian Infantry Division, was able to concentrate on the disposition of his field ambulances, Nos. 4, 5, and 9 were left in close support of the 1st 2nd, and 3rd Brigades respectively, even though the main attack was to be carried out on a two-brigade front. Casualty collecting posts were sited close behind the battalions, advanced dressing stations immediately to the rear of brigade headquarters.

Meanwhile the 5th Armoured Division had been moving forward. By 22 May it was concentrated in a forward assembly area east of the Forme

D'Aquino to the right rear of the 1st Division, preparing for its exploitation role in the forthcoming battle. No. 7 Light Field Ambulance and No. 24 Field Ambulance had both opened advanced dressing stations, for with the area under shellfire casualties were fairly numerous. Its lines of evacuation were the same as those of the 1st Division.

The heavy influx of casualties that followed the launching of the attack on the Hitler Line at 6 a.m. on 23 May necessitated the early opening of No. 3 Field Dressing Station to replace No. 1 as the advanced surgical centre, for the latter was soon full. No. 13 had to be committed later in the day to augment the facilities of No. 3. In anticipation of such a development, the A.D.M.S., Canadian Section, G.H.Q. 1st Echelon had been asked to supply four auxiliary surgical teams from the general hospitals. These proved of the utmost value. By the afternoon of the 23rd four field surgical units, two auxiliary surgical teams, and two field transfusion units were working at full capacity in the joint advanced surgical centre. Nursing sisters had also been brought forward from the hospitals, and were being employed in the post-operative care of patients.

Canadian battle casualties on 23 May, exclusive of those in the 1st Canadian Special Service Battalion with the Fifth Army, totalled 272 killed and 601 wounded. Though there were numerous difficulties, there was nothing that could be termed a medical crisis even in the battle area itself. Nos. 5 and 9 Field Ambulances both moved their advanced dressing stations forward during the day in order to maintain close contact with their brigades and thus overcome the time lag that congested traffic conditions tended to create in clearing casualty collecting posts. From four to six ambulance cars from No. 1 Motor Ambulance Convoy were available at each advanced dressing station at all times. Many casualties from the 2nd Brigade on the right flank were evacuated through the advanced dressing stations of the 5th Division. With the final piercing of the Hitler Line at nightfall, the flow of casualties slackened. Wounded continued to arrive at the joint advanced surgical centre and at the casualty clearing stations throughout the night, but the peak had been passed. That same night, accordingly, preparations were begun to move No. 5 Casualty Clearing Station forward from Mignano.

No. 7 Light Field Ambulance, remaining open in the forward assembly area, cleared most of the casualties suffered by the 5th Armoured Division in the second phase of the operation. But on the afternoon of the 25th, prior to the movement of the 11th Infantry Brigade through the bridgehead that had been secured over the Melfa, No. 24 Field Ambulance opened an advanced dressing station west of the Pontecorvo-Aquino road and took over full responsibility for clearing the divisional front. That same afternoon, pending the possibility of No. 7 Light Field Ambulance establishing an advanced dressing station on the far side of the river, two sections of No. 24 combined to form a light advanced dressing station' on the south

bank in the vicinity of the crossings. On the flank, No. 9 Field Ambulance had established an advanced dressing station west of Pontecorvo, one of its companies being with the 1st Division's pursuit force.

Meanwhile No. 5 Casualty Clearing Station had been brought up to a position opposite the advanced surgical centre based on Nos. 3 and 13 Field Dressing Stations. Here it opened on the morning of 25 May, greatly shortening the ambulance journey for Priority II casualties. That evening, with the evacuation of Priority I and II casualties becoming increasingly difficult due to the heavy traffic congesting forward routes, an advanced surgical centre was opened in Pontecorvo by No. 16 Field Dressing Station. This step proved most opportune, for during the night numerous casualties were suffered by administrative units of the armoured division in an air attack. Most of these reached the surgical centre in Pontecorvo within an hour of being wounded.

By 26 May the 5th Armoured Division was well across the Melfa. On that date two sections of No. 7 Light Field Ambulance opened a 'light advanced dressing station' midway between the river and Ceprano. Unit headquarters crossed the river the following day and took over from its forward sections. This advanced dressing station served the division until Ceprano was cleared. No. 24 Field Ambulance then moved ahead and opened just south of Ceprano to cover the advance towards Frosinone. No. 7 Light Field Ambulance was preparing to move to the Pofi area when on 30 May the 1st Infantry Division took over the task of pursuing the now rapidly retreating enemy.

Since 25 May the majority of casualties in the 1st Canadian Corps had been evacuated either to the advanced surgical centre at Pontecorvo or to No. 5 Casualty Clearing Station several miles further south. By the time the 1st Division was ordered to relieve the 5th this line of evacuation had become stretched almost to the limit. Late on 29 May, accordingly, No. 8 Field Dressing Station established an advanced surgical centre in Ceprano. When No. 5 Field Ambulance opened south of Pofi on 30 May in support of the 2nd Brigade, it had therefore to evacuate Priority I and II casualties only a short distance. Final relief from the long trip to Pontecorvo was provided on 31 May, when No. 4 Casualty Clearing Station opened half a mile west of Ceprano to receive all Priority III battle casualties and all sick west of the Liri River. No. 16 Field Dressing Station and No. 5 Casualty Clearing Station remained where they were to take care of such casualties as might occur east of the river.

As the 1st Division pushed forward from the Pofi area to Frosinone, Ferentino, and finally Anagni, Nos. 4 and 5 Field Ambulances established successive advanced dressing stations along the axis respectively of the 1st and 2nd Brigades. By 4 June No. 4 had its advanced dressing station in Anagni itself. Just east of Ferentino, along Highway No. 6, No. 2 Field Dressing Station opened an advanced surgical centre on 3 June. This centre

received not only Canadian but also a number of British and South African Priority I and II casualties. These latter came from the 6th South African Armoured Division, which had come temporarily under command. of the 1st Canadian Corps.

During these first few days of June No. 4 Casualty Clearing Station at Ceprano became increasingly busy with minor battle casualties and sick, both military and civilian, even though No. 13 Field Dressing Station had been opened to receive sick from the 5th Division. In anticipation of the advance continuing, No. 3 General Hospital, which thus far had remained in the original Corps Troops assembly area, was ordered to Ferentino. At the last moment it was diverted to Anagni, where excellent accommodation had been found in buildings formerly housing a German military hospital. Accompanied by No. 1 Advanced Depot Medical Stores, No. 3 General Hospital reached its new location during 4 June, just before the 1st Canadian Corps was withdrawn into reserve. The medical service was thus left in the anomalous position of having a hospital and an advanced depot medical stores as two of its three most forward units. The Corps neuropsychiatric centre and the Corps venereal disease treatment centre were still functioning in rear of the casualty clearing stations.

The Tactical Employment of Medical Units

The tactical employment of medical units in the offensive thus concluded merits a more detailed analysis than has been possible in the foregoing chronological account. It was the first occasion on which the field medical organization devised by the Hartgill Committee was fully tested in battle, since the British formations of the Eighth Army had not yet adopted it fully. Apart from the grouping of all field dressing stations under the control of the D.D.M.S., the tactical doctrine evolved by that Committee was strictly followed. In the broader sphere, there were combined within a short period of time all the elements of the successful modern battle; the approach against stiffening opposition; the set-piece attack; the breakthrough; the pursuit. The infantry and armoured divisions were employed in their text-book roles.

Canadian battle casualties from 11 May to 4 June, exclusive of those suffered by the 1st Canadian Special Service Battalion in the breakout from the Anzio bridgehead, totalled 903 killed and 2574 wounded.* Not all, but over 2200 of these wounded passed through medical installations of the 1st Canadian Corps, which handled in addition over 400 battle casualties from other forces. Injuries and sickness during the same period accounted for approximately 4000 admissions.† Despite this heavy casualty load and the poor condition of the roads available for evacuation purposes, many of them

* H.S. 133.065 (D345): Casualty States for the Campaign in Italy.

† 11 /AAI 1 Corps /1: Quarterly Report, D.D.M.S., 1 Cdn Corps, April - June 1944.

little more than cross-country trails cut or improved by the engineers, the medical service functioned smoothly and efficiently. Participants will no doubt recall isolated instances of a wounded man who lay too long where he fell, a regimental aid post swamped with casualties, a loaded ambulance car stuck by the side of a track or hopelessly entangled in a traffic jam, or a whole medical unit delayed in reaching its destination. Such happenings are inseparable from war in the best of circumstances. By and large, however, the Liri Valley offensive constituted for the R.C.A.M.C. a model operation. At its conclusion Major-General Hartgill, at this date D.M.S., Allied Force Headquarters, expressed himself as delighted with the manner in which the field medical organization he had done so much to shape had been employed by the 1st Canadian Corps. "Never before", he said, "had casualties reached hospital so quickly and in such good condition".*

The Field and Light Field Ambulance

The employment of the field ambulance (headquarters and two bearer companies each of three sections) differed in the two divisions. Each of the three available to the infantry division was placed in more or less permanent support of a particular brigade. One bearer company was used for evacuation in front of the advanced dressing station, the other was held in reserve usually in the divisional administrative area. The forward company maintained a casualty collecting post to clear the whole front of the brigade being supported, supplying extra stretcher bearers and jeep ambulances to regimental medical officers as required. The reserve company, as well as forming a tactical reserve, was available to assist the personnel of headquarters company in operating the advanced dressing station. The latter was normally located on a "down" traffic route slightly in rear of the brigade headquarters, approximately three miles behind the front line. The one field ambulance of the armoured division was made responsible for casualties in the motor battalion as well as in the infantry brigade. One bearer section was allotted to each of these four battalions, the two remaining sections being held in reserve. Headquarters company as in the infantry division, maintained an advanced dressing station at about the level of brigade headquarters, but this was echeloned with that of the light field ambulance, so that normally as one opened the other closed and leap-frogged ahead.

The light field ambulance (headquarters and four sections) of the armoured division placed one section with each armoured regiment of the armoured brigade and the fourth with the divisional armoured reconnaissance regiment. When a unit was deployed over a wide front the bearer section covered one flank, the regimental medical officer the other. When an independent tank brigade was employed under command of the infantry division the brigade's light field ambulance maintained an advanced dressing

* W.D D.D.M.S., 1 Cdn Corps, 6 June 1944.

station in the divisional administrative area, where local sick from the brigade were retained. So that it might function in this fashion, the headquarters company was reinforced by one bearer section. The three remaining sections were attached one to each armoured regiment. As one armoured regiment supported each infantry brigade, casualties were evacuated through the advanced dressing station clearing that brigade.

Generally speaking the commander of either type of divisional field ambulance was responsible for maintaining close liaison with the brigades, for the collection and triage of all casualties from brigade areas, and for the evacuation of Priority I and II casualties to an advanced surgical centre. A modification of this in the case of the 5th Armoured Division was that all these responsibilities devolved upon the commander of whichever unit had the forward and open advanced dressing station. He controlled not only his own unit but also whatever sections of the other happened to be in action. The collection of casualties from regimental aid posts was accomplished in the main by jeep ambulance, but when necessary by stretcher bearers on foot. In rear of casualty collecting posts it was usually possible to employ ambulance cars.

The Field Dressing Station

The field dressing station functioned principally as the nucleus to which were added field surgical and field transfusion units to form an advanced surgical centre, though on occasion as an installation for minor sick. Both before and after the D.D.M.S. assumed full operational control of the six field dressing stations available, advanced surgical centres were established successively on the main "down" traffic route. Prior to the crossing of the Melfa the average distance between these was from five to six miles. During the pursuit phase this interval increased to over ten miles. They were sometimes in close proximity to our own and well within range of enemy artillery. "The speed with which traffic became congested following each new advance made it imperative that responsibility for a certain amount of risk be assumed and that advanced surgical centres, be moved forward early, if indeed they were to be moved at all."* As a question of policy, the advisability of siting advanced surgical centres within range of enemy artillery is no doubt open to argument. It would appear in this operation to have been fully justified, not so much by the special considerations involved as by the results achieved: "a total of 205 critically wounded soldiers were operated upon with a post-operative mortality of only 16.5 per cent".*

When an advanced surgical centre ceased admitting casualties, the surgical and transfusion teams departed for one further forward, leaving the post-operative care of patients to the field dressing station personnel and the attached nursing sisters especially provided from the general hospitals. As a

* Quarterly Report, D.D.M.S., 1 Cdn Corps, *op cit*.

result there were 'nests' of serious post-operative cases to be found at various points along the axis of advance. The Consultant Surgeon, Canadian Military Headquarters, recorded the following impression on visiting three of these 'nests' :

It was most gratifying to see several post-operative abdominals, chests and compound fractures, most of which had been operated on within 12 hours, now comfortably placed in good beds with mosquito nets, intravenous fluids being given, duodenal suction, and indeed practically every post-operative care, including expert nursing. Too much praise cannot be given to these sisters who work unceasingly, oftentimes with little sleep, and giving their best at all times, not only in post-operative care but in assisting the surgeons of the Field Surgical Units. . . .*

The Casualty Clearing Station and the 200-Bed General Hospital

The two casualty clearing stations were employed in orthodox fashion under the control of the D.D.M.S. Like other medical units they were sited on the main "down" route. As a rule they were sited some five miles behind the front line at the beginning of a battle and moved forward whenever their distance from this line became more than 15 miles. Both were normally open, receiving alternately 100 patients in succession, but if necessary casualties were all directed to one, as when the other was in the process of moving.

The 200-bed general hospital was used less as a roadhead hospital than as a stationary casualty clearing station for Priority III casualties and sick, though until ordered to Anagni it acted also as a staging centre on the long ambulance run from Cassino to Capua. Of most importance, perhaps, it was found to be an excellent source of readily available reinforcements for the more forward units, by virtue of its generous complement of medical officers and nursing sisters.

In so far as battle casualties were concerned, these units received mainly Priority III cases. But a number of Priority I and II were deliberately referred to casualty clearing station from a busy advanced surgical centre to avoid pre-operative delay. Altogether, 563 cases came to operation in Nos. 4 and 5 Casualty Clearing Stations and No. 3 General Hospital, with a post-operative mortality of 4 per cent.†

The Field Surgical and Field Transfusion Units

The four field surgical units were employed mainly in the advanced surgical centres, but were used on occasion to augment the facilities of the casualty clearing stations. In their principal role, two units were the normal

* H.S. 224C1. 7013(D1): Report on Trip to Mediterranean Theatre, 19 May 1944 - 3 June 1944, by Colonel J. A. MacFarlane, 6 June 1944.

† Quarterly Report, D.D.M.S., 1 Cdn Corps, *op cit.* Appx D3.

allotment to the active field dressing station, where they worked in alternate eight or twelve hour shifts. The four auxiliary surgical teams provided by the general hospitals functioned similarly.

The three field transfusion units served a dual purpose. As well as supervising pre- and post-operative resuscitation in advanced surgical centres, they distributed transfusion media and equipment to forward medical units. To ensure a 24 hour resuscitation service, one additional transfusion orderly was attached to each field transfusion unit from the casualty clearing stations. The field transfusion officer himself was usually assisted and relieved by a medical officer from the field dressing or casualty clearing station concerned. But this latter arrangement was found to be unsatisfactory, as in many cases the relieving officer had not been specially trained in resuscitation procedures.

Post-operative nursing care was supervised by medical officers of the field dressing stations, assisted by nursing sisters attached from the general hospitals. It is emphasized that without the excellent post-operative care provided, the work of the surgeons would have been of little avail however far forward they might have been positioned. Altogether 22 nursing sisters worked in the 1st Canadian Corps area during the battles of the Liri Valley, eight in operating theatres and 14 in post-operative wards.

Mobile Laboratories

The role of the mobile laboratories was most important, though little has been said of them because of the very specialized nature of their work.

The forward element of No. 1 Research Laboratory was attached in turn to various advanced surgical centres. Its base element remained at No. 14 General Hospital. On the side of pure research, this unit investigated not only the ever present problem of wound shock but also such matters as post-operative anuria, post-transfusion haemolytic reactions, and, particularly in cases of gas gangrene, the bacteriology of wounds. Post-mortems conducted by its pathologists were of value to the surgeons. The distribution of penicillin, which was just beginning to make its appearance in the Italian theatre, and the supervision of penicillin therapy were also during this period made the responsibility of the research laboratory. Finally, it gave invaluable assistance to resuscitation officers by providing the means of assessing accurately the condition of cases requiring transfusion.

No. 1 Mobile Bacteriological Laboratory was employed at the Corps venereal disease treatment centre, where it performed Kahn tests and haematological examinations in addition to routine bacteriological procedures. No. 1 Mobile Hygiene Laboratory was attached first to No. 5 Casualty Clearing Station and later to No. 3 General Hospital. Most of its work was in bacteriology and haematology.

The Motor Ambulance Convoy

No. 1 Motor Ambulance Convoy was responsible primarily for clearing Priority III casualties from advanced dressing stations to the casualty clearing stations or to the 200-bed general hospital. One platoon of 30 ambulance cars and two troop-carrying vehicles for sitting cases were placed under command of each A.D.M.S. As a more or less constant allotment, each open advanced dressing station was provided with one section of six ambulance cars. A control point was established in rear of the advanced dressing station, where one or more sections were stationed in reserve. As loaded ambulances were checked through, empty ones were sent forward to replace them, ensuring as far as possible a continuous supply of ambulances at even a very busy advanced dressing station. In times of stress, when field ambulance transport threatened to be insufficient, the motor ambulance convoy assisted in clearing Priority I and II casualties to advanced surgical centres.

Evacuation Beyond the 1st Canadian Corps

The ambulance control post at Capua was in effect a distributing centre for all Eighth Army casualties. Between the long lines of tents, ambulances from all sectors of the front unloaded. With little delay, patients found themselves in another ambulance bound for a British, Canadian, New Zealand, or other hospital, depending on their nationality. The distributing officer kept before him a list of all hospitals in the base area, together with accurate information as to their bed states, so that it was possible to ensure that no hospital was asked to take more patients than it could handle. Loaded ambulances were sent off singly rather than in convoy, as this led to less congestion on the relatively good roads between Capua and the base hospital area about Caserta and Naples. A few cases were detained at the distributing centre for emergency treatment such as a blood transfusion, but the majority passed right through after their dressings had been checked.

As a result of this system the majority of Canadian casualties reached Canadian hospitals, most of them within a relatively short time. A few, notably those with head, nerve, or blood vessel injuries, were directed as a matter of policy to British hospitals where special surgical teams were available for their treatment.

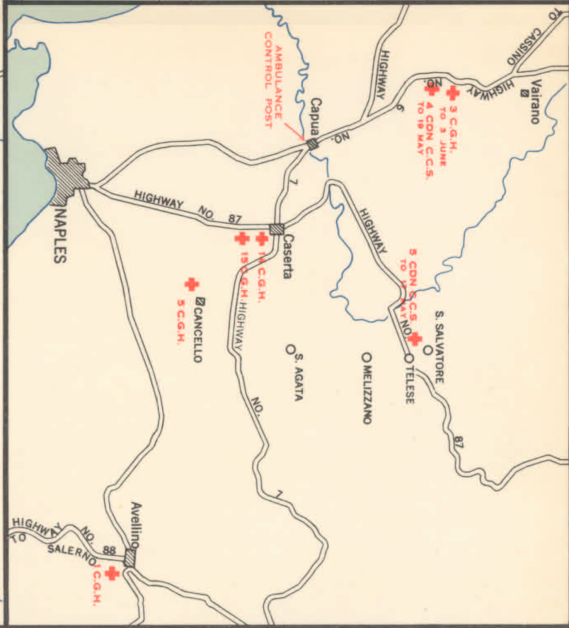
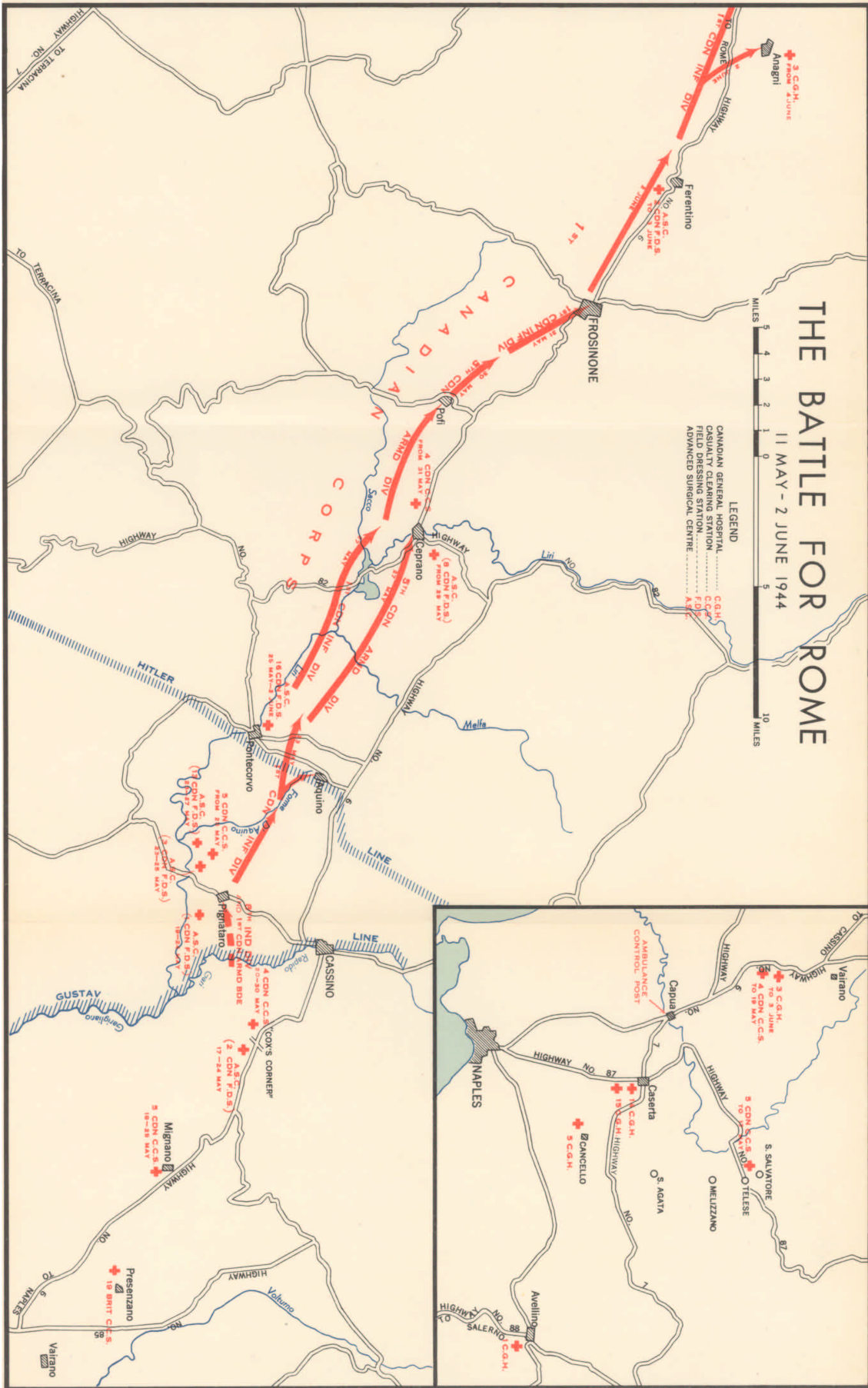
Nos. 14 and 15 General Hospitals had been designated to receive the bulk of the Canadian casualties from this operation, so as to leave the two 600-bed units in a position to move forward. Until casualties began to reach them from the attack against the Hitler Line and the subsequent fighting along the Melfa, no serious difficulties developed. Before 26 May was over, No. 14 had received about 900 battle casualties, No. 15 slightly more than 1000, bringing the total number of patients on hand in each hospital to approximately 1600. No. 15 found its resources severely taxed

THE BATTLE FOR ROME

11 MAY - 2 JUNE 1944



LEGEND
 CANADIAN GENERAL HOSPITAL
 CASUALTY CLEARING STATION
 FIELD DRESSING STATION
 ADVANCED SURGICAL CENTRE
 CGH
 C.C.S.
 F.D.S.
 A.S.C.



at this time. No. 14, with a somewhat larger capacity and fewer battle casualties to deal with, remained in a position to accept further patients. But that night, by arrangement with the ambulance control post, admissions to both hospitals were stopped for the next 15 hours and casualties diverted to No. 5 General Hospital at Cancellino and No. 1 at Avellino. In addition, a surgical team and several medical officers were taken from No. 1 to assist the staff at No. 15.

These measures proved quite sufficient to restore the hospital situation to a reasonably satisfactory position. The flow of casualties gradually decreased as the battle entered its final phase. A considerable number of long-term cases were cleared from the base area by hospital ship during the last few days of May. Discharges, and the routine transfer of convalescents to No. 1 Convalescent Depot, both divisions of which had by this time been concentrated at Mercatello, again began to exceed admissions. On 31 May, only five days after the peak of the casualty flow, each hospital had a substantial number of empty beds, aggregating 880.

All ended well. But it will be readily apparent that the margin of safety was small, even bearing in mind that intentionally the facilities of Nos. 1 and 5 were not employed fully. The hospital surgical staffs were weakened to some extent by the provision of auxiliary surgical teams for the field. But these could have been returned to the hospitals only at the expense of forward surgery. Had the Germans been able to prolong a stubborn defence of the Hitler Line and the Melfa River, the number of Canadian hospital beds in the theatre would probably have proved insufficient.

Advance to the Senio

Summer Interlude

After completing its task in the Liri Valley the 1st Canadian Corps withdrew to the valley of the Volturno River. No. 5 Casualty Clearing Station re-opened in the "Grand Hotel", Telese, as a Corps medical centre. Grouped with it were Nos. 2 and 3 Field Surgical Unit, No. 2 Field Transfusion Unit, a 250-bed detachment from No. 1 Convalescent Depot, and No. 2 Exhaustion Unit. The latter had been authorized with effect from 14 June to replace the *ad hoc* Corps neuropsychiatric centre based on the light section of No. 8 Field Dressing Station. Minor sick from the division were held in the divisional field dressing stations. The light section of No. 3 Field Dressing Station, with No. 1 Mobile Bacteriological Laboratory attached, continued to function as a venereal disease treatment centre. Upon this improvised unit a heavy volume of work devolved, for the incidence of venereal disease, in the words of the D.D.M.S., "reached alarming proportions".* Presumably as a result of this experience, the formation of No. 2 Venereal Disease Treatment Unit was authorized a few months later.

During July, by means of an internal reorganization within the Corps, the 12th Canadian Infantry Brigade was formed as a third brigade for the 5th Armoured Division. As the addition to the Division's medical service thus made necessary, No. 8 Field Dressing Station was converted to No. 8 Light Field Ambulance.

Sick and injured requiring evacuation beyond the Corps were sent by No. 1 Motor Ambulance Convoy to either Nos. 14 or 15 General Hospital at Caserta or to No. 1 at Avellino. No. 5, in conformity with the general medical plan for the theatre, moved to Rome at the conclusion of the Liri Valley offensive. Up to the end of July it received some casualties from the 1st Armoured Brigade, which was helping the 13th Corps to drive the Germans towards Florence, but a few British and a large number of prisoners of war constituted the majority of its patients. No. 14 closed about the middle of July, preparatory to a forward move when the 1st Canadian Corps should return to the line. No. 3 General Hospital, which had been left at Anagni in anticipation of a possible future requirement in that area, was withdrawn from the control of the D.D.M.S. on 25 July and recalled to Avellino to serve the base reinforcement group and thus release No. 1 for duty elsewhere.

* 11 /AAI 1 Corps /1 : Quarterly Report, D.D.M.S., 1 Cdn Corps, July – September 1944.

The Gothic Line

At the end of July the 1st Canadian Corps began to move northward again, this time to the Foligno area, in anticipation of taking part in a concentrated drive through the central Apennines against Bologna. The 1st Division entered the line near Florence on 5 August, under command of the 13th Corps. But the plan had already been changed. The new intention was to launch a two-pronged attack against Bologna. The Eighth Army would strike first along the Adriatic coast and then north-west, the Fifth Army directly at the objective from Florence. The 1st Division consequently returned to the command of the 1st Corps after only three days in the line. Shortly thereafter the whole Corps moved in great secrecy eastward across the mountains to a new concentration area in the region of Jesi.

There No. 5 Casualty Clearing Station was opened to provide medical and surgical facilities for the Corps, and by various expedients was expanded to hold over 300 patients. Even so, its resources were taxed to the limit by the sick and injured. Rather than commit the other casualty clearing station or one of the field dressing stations on the eve of battle, the D.D.M.S. used the headquarters company of No. 6 British Light Field Ambulance to ease the strain. This unit formed part of the 21st British Tank Brigade, which had been placed under command of the 1st Canadian Corps to provide the necessary armoured support for the 1st Canadian Division.

The Eighth Army's first problem under the new plan was to crack the enemy's well prepared Gothic Line, which in the Adriatic sector stretched westward from Pesaro along the northern bank of the Foglia River. Forward of this main position was an outpost line along the River Metauro. To breach these defences a simultaneous attack by the 5th British, the 1st Canadian, and the 2nd Polish Corps was planned. Capture of the key feature, a prominent elevation some eight miles west of Pesaro (Tomba di Pesaro), was assigned to the Canadians in the centre. This was a formidable task, involving an assault crossing of both rivers before an attack could be launched against the main objective.

The date for the attack was 25 August. Canadian medical preparations were completed by the 23rd. The five field dressing stations, the field surgical and the field transfusion units had all been brought once again under the operational control of the D.D.M.S., since this arrangement had proved so satisfactory in the Liri Valley. Additional surgical teams and nursing sisters had been requested and provided from the base hospitals. No. 1 General Hospital had opened at Jesi, while No. 14 was on the point of opening at Perugia.

On 24 August, as the 1st Division began to close up to the Metauro River, No. 4 Casualty Clearing Station, with Nos. 1 and 4 Field Surgical Units, Nos. 1 and 3 Field Transfusion Units, a surgical team from No. 14 General Hospital, and extra nursing sisters, moved forward to an excellent site at the junction of the main "down" route and the lateral road paralleling

the north-west bank of the Cesano River, in the vicinity of S. Michele. They were to constitute the advanced surgical centre for the opening phase of the battle. On 25 August the headquarters of No. 6 British Light Field Ambulance (No. 2 Canadian Exhaustion Unit attached), and Nos. 3 and 16 Canadian Field Dressing Stations, the latter with attached nursing sisters, field surgical and field transfusion units, also moved to the area about S. Michele, the two field dressing stations remaining closed on wheels. Nos. 4 and 5 Field Ambulances, supporting the 1st and 2nd Infantry Brigades respectively, had each opened an advanced dressing station a few miles in front of S. Michele. When at 10:35 p.m. on 25 August the leading elements of these brigades began to ford the Metauro all was in readiness for the reception of a large number of casualties.

The initial objectives in fact were seized with little difficulty and at small cost, for the enemy had carried out a planned withdrawal from his forward positions, unaware of the blow being prepared against him. But the subsequent advance to the Foglia was so hindered by mines, demolitions, and small parties of stubborn Germans that it was 30 August before contact was made with the main defences of the Gothic Line.

Casualties in the 1st Canadian Corps during this phase totalled 109 killed and 415 wounded. No. 4 Field Ambulance, opening just north of the Metauro on the 26th, cleared the 1st Division until 29 August, when No. 9 opened to the east of Ginestreto some six miles further forward. All Priority I and II casualties were sent to No. 4 Casualty Clearing Station until the 28th. By that date No. 16 Field Dressing Station had opened an advanced surgical centre north of the Metauro, along the main lateral road to Fano. On 30 August this centre was moved forward to Mombaroccia, approximately midway between the Metauro and the Foglia. Priority III casualties, in need of less immediate treatment, were all evacuated by the motor ambulance convoy directly to No. 1 General Hospital at Iesi.

By 30 August the 5th Armoured Division had taken over the left flank of the Corps front. That afternoon the 3rd and 11th Infantry Brigades led a two-division assault across the Foglia against the main defences of the Gothic Line. The Germans put up a hard fight before they were finally driven from their positions along the north bank of the river. The subsequent attacks of the 1st Division to the right and the 5th to the left of the Tomba di Pesaro met with equally strenuous opposition. Nevertheless, by the evening of 1 September the Gothic Line had been pierced and the way opened for exploitation beyond.

This bitter fighting cost 104 Canadians killed and 271 wounded on 31 August, 97 killed and 202 wounded on 1 September. Next day, as the Corps fanned out behind the Gothic Line, the 1st Division towards the sea at Cattolica, the 5th north-west towards the Conca River, there were a further 34 killed and 118 wounded, bringing the total for the three days to 235 killed and 591 wounded.

The 5th Armoured suffered the most, and at the height of the battle the advanced dressing station established by No. 24 Field Ambulance at Monteciccardo to cover the crossing of the Foglia had to be reinforced. No. 9 Field Ambulance, which prior to the attack had moved its advanced dressing station into Ginestreto, was able by itself to deal with the smaller number of wounded from the 1st Division. The capacity of the advanced surgical centre at Mombaroccia was doubled by opening No. 3 Field Dressing Station with its attached units alongside No. 16. No. 4 Casualty Clearing Station was able to accept only a limited number of Priority III cases, as it was still holding post-operative Priority I and II patients, the legacy of its function as an advanced surgical centre during the opening stages of the offensive. The majority of Priority III casualties therefore continued to be evacuated directly to No. 1 General Hospital.

By the morning of 3 September, with Cattolica captured and both divisions in the process of crossing the Conca River, No. 1 Field Dressing Station had an advanced surgical centre well established at the junction of the main "down" route and the lateral road that follows the south bank of the Foglia to Pesaro. No. 5 Casualty Clearing Station had opened across the road from it. Later in the day they were joined by No. 6 British Light Field Ambulance, which, with No. 2 Canadian Exhaustion Unit still attached, was treating minor sick and psychiatric cases. On the other side of the river, meanwhile, No. 4 Field Ambulance had opened in S. Giovanni, and No. 8 Light Field Ambulance about two miles south-west of that place.

As a result of stiffening German resistance north of the Conca, the advanced surgical centre based on No. 1 Field Dressing Station filled rapidly on 4 September, and No. 5 Casualty Clearing Station found itself equally busy with Priority III cases. No. 2 Field Dressing Station, with the now normal allotment of two field surgical units, one field transfusion unit, and six nursing sisters attached, was therefore directed to S. Giovanni, where on the morning of the 5th an advanced surgical centre was opened little more than three miles behind the front.

By 5 September the offensive was grinding to a temporary halt. The 1st Infantry Division had penetrated to the Melo River and occupied Riccione. The 5th Division had secured the heights about Misano, but was making little progress against the strong enemy positions on the northeast end of the Coriano Ridge. This same feature was creating even greater difficulties for the 5th British Corps on the Canadian left. The situation remained essentially unchanged throughout 6 September. Then came the rain. The battle field became a virtual sea of mud, and small streams turned into swollen torrents. Large-scale operations were rendered impossible for almost a week.

Among the ill results of nature's intervention was the washing out of all bridges over the Foglia west of Pesaro during the night of 7-8 September. This effectively isolated No. 1 Field Dressing Station and No. 5 Casualty Clearing Station south of the river. For the next 24 hours it was necessary

to direct all Priority I and II casualties to No. 2 Field Dressing Station in S. Giovanni and all those of Priority III *via* Pesaro to a British casualty clearing station at Fano. By the morning of the 9th No. 5 Casualty Clearing Station had moved north of the Foglia by the coast road and opened in Cattolica. No. 4 had been ready to open about two and a half miles north-west of Cattolica on the 8th, but the D.D.M.S. had decided to keep it closed for the time being because of its proximity to the enemy.

By 8 September, also, No. 9 Field Ambulance had established an advanced dressing station about halfway between Cattolica and Riccione, along the axis of the 1st Division's successful penetration up the coast. Nos. 4 and 5 Field Ambulances were in Cattolica on wheels. In support of the 5th Division, No. 24 Field Ambulance and No. 8 Light Field Ambulance had opened 'light' advanced dressing stations over the Conca, on the right and left flanks respectively. In the course of the next day or so, as the fighting died down, that of No. 24 situated to the south of Misano was developed into a normal advanced dressing station, while the other was closed.

A regrouping of forces within the Eighth Army in preparation for a renewal of the offensive brought the 4th British Division, the 2nd New Zealand Division, and a Greek Mountain Brigade under command of the 1st Canadian Corps. On the night of 12-13 September the 5th Canadian Division participated with two divisions of the 5th Corps in a successful attack on the Coriano Ridge, while on the right the 1st Canadian Division and the Greek Mountain Brigade drove across the Marano River towards Rimini. As the front thus began to move forward again, the 5th Canadian Division was relieved by the 4th British Division. But for the 1st Canadian Division stiff fighting lay immediately ahead. In its path the enemy was strongly posted in the village of San Martino and on the dominating height of land rising behind it to the crest topped by San Fortunato. It was not until the 18th, after bitter and costly fighting, that San Martino was finally cleared. It took a full-scale divisional assault on the night of 19-20 September to eject the occupants of San Fortunato.

Three advanced surgical centres were open at the beginning of the new offensive: No. 2 Field Dressing Station, with Nos. 1 and 4 Field Surgical Units, No. 1 Field Transfusion Unit, and the auxiliary surgical team from No. 15 General Hospital attached, in S. Giovanni; No. 4 Casualty Clearing Station, with Nos. 2 and 3 Field Surgical Units, No. 2 Field Transfusion Unit, and a Greek field surgical unit attached, on the coast to the north-west of Cattolica; No. 5 Casualty Clearing Station, with the auxiliary surgical team from No. 14 General Hospital and No. 3 Field Transfusion Unit attached, in Cattolica itself. The two casualty clearing stations were also prepared to accept Priority III casualties.

The cost of Canadian success of 13 September fell mainly on the 5th Armoured Division; over 200 wounded passed through No. 24 Field

Ambulance's advanced dressing station south of Misano.* The 1st Infantry Division, according to the records of the A.D.M.S., subsequently lost nearly 1000 men in wounded alone before the Fortunato Ridge was finally cleared.† These were evacuated through No. 9 Field Ambulance's advanced dressing station midway between Cattolica and Riccione until 16 September, when No. 5 opened in Riccione. With Canadian battle casualties from 13 to 20 September totalling 453 killed and 1351 wounded, not to mention those suffered by the Greek and British formations under Canadian command, all three advanced surgical centres worked to capacity. The addition of a British field surgical unit to No. 5 and of a New Zealand one to No. 4 Canadian Casualty Clearing Station proved a sufficient increase in existing facilities to meet all requirements, As reported in the war diary of the D.D.M.S. for 18 September:

Though fully extended our surgical centres are experiencing no difficulty in coping with the situation. The initial siting of the two casualty clearing stations so far forward (3000 yards from the forward defended localities), incurring as it did a certain amount of risk, has been more than justified by the work they have been able to do in these excellent locations.

At all events Nos. 3, 13, and 16 Field Dressing Stations remained on wheels in the Corps rear area throughout this period; No. 1 was holding post-operative patients south of the Foglia. Normal evacuation beyond the Corps was still to No. 1 General Hospital. Most British and Greek casualties were passed on to two British casualty clearing stations at Fano, and a few cases requiring special treatment were directed to a British general hospital at Loreto.

Following the capture of the Fortunato Ridge, the 1st Division quickly established bridgeheads across the Marecchia River. Then, on 22 September, it was relieved by the 2nd New Zealand Division. On the same date the 5th Canadian Armoured returned to the line to replace the 4th British Division. Contrary to expectations progress continued to be slow, for rain had again come to the assistance of the enemy. Instead of the armour lunging forward, the infantry had to force a way over one water obstacle after another. The Uso was successfully crossed, but the end of September found the 1st Corps halted along the south bank of the Fiumicino River.

The 2nd New Zealand Division was accompanied northward by its own field ambulances, which by the end of the month were all located between the Marecchia and the Uso. They evacuated to the advanced surgical centers about Cattolica in the same manner as the Canadians but further evacuation for New Zealanders was to their own hospital at Senigallia. No. 8 Light Field Ambulance covered the 5th Armoured Division's crossing of the

* 11 /AAI 5 Div/1 : Quarterly Report, A.D.M.S., 5 Cdn Armed Div, July - September 1944.

† H.S. 239C1.7 (D7) Quarterly Report, A.D.M.S., 1 Cdn Inf Div, July - September 1944.

Marecchia River, but on the 27th, with bridgeheads established across the Uso, No. 7 opened at S. Giustina. At the end of the month the latter was still clearing the divisional front from this location.

Since 25 August, according to figures compiled by the D.D.M.S., a total of 6149 wounded men had been admitted to medical units serving with the 1st Canadian Corps. Of these, 3769 were Canadians. The remaining 2380 were mostly British, New Zealanders, or Greeks, but included a miscellaneous group of Americans, South Africans, Poles, Italians, and Germans. In addition, there had been 5744 sick admitted from all forces within the Corps, making a grand total of 11,893 patients during the 37-day period.*

Among the causes of sickness, it is interesting to note, proven malaria took sixth place. From the beginning of July to the end of September Canadian malaria admissions totalled only 692. Though unclassified fevers accounted for another 1196, of which a proportion was no doubt malaria,* the improvement over the previous malaria season was marked. The improvement in fact was general, a clear reflection of the success of the anti-malaria control programme applied by the Eighth Army after its experience in Sicily.

Medical Reorganization

During the latter part of September, as the offensive was once again slowing to a stop in a sea of mud, a considerable reorganization took place within the medical service of the 1st Corps. Though the precipitating factor was a general drive to effect economies in manpower, the idea had been maturing for some time in the mind of the D.D.M.S. It was his opinion that experience had shown the existing organization to have an unbalanced distribution of personnel. Taken as a whole the medical service was efficient, he argued, but some units had too many, others too few personnel for the functions they fulfilled.*

All the field ambulances were converted to light field ambulances of a headquarters and four sections each, on the ground that they had never had to employ their full resources and had usually been able to keep a whole company in reserve. In the 1st Division this change took place immediately after it was withdrawn into reserve on 22 September. No. 24 Field Ambulance was converted while the 5th Armoured Division was forcing its way across the Marecchia and Uso Rivers, all casualties being dealt with over the interval by the two existing light field ambulances.

Four field dressing stations were made Corps Troops units and thus placed permanently under the control of the D.D.M.S. The fifth, No. 3, departed for Avellino during the last week of September to become No. 1 Field Hospital (50 beds) and free No. 3 General Hospital (200 beds) for duty

* Quarterly Report, D.D.M.S., 1 Cdn Corps, July - September 1944, *op cit.*

with the Corps. The field dressing stations were also given some extra transport to enable them comfortably to carry the beds, mattresses, and other hospital equipment required for the care of post-operative patients. They had for some time been forced to carry these stores in view of the inability of the field surgical units to do so as originally intended, but it had meant overloading their vehicles.

To each of the two casualty clearing stations were added two medical officers and four orderlies trained in resuscitation, four nursing sisters for the permanent staff, and six nursing sisters (including two operating room supervisors) for duty at advanced surgical centres. This was to compensate for the fact that they were being employed much further forward and performing a greater volume of surgical work than had been anticipated.

Reflecting current practice, two surgical groups, each consisting of two field surgical units, one field transfusion unit and six nursing sisters, came into more or less permanent existence. Each group was based on a casualty clearing station and was to return there when not otherwise employed. The third field transfusion unit was disbanded. The two remaining were each reinforced by two medical officers withdrawn from field dressing stations.

The only important change desired by the D.D.M.S. that was not carried out was the disbandment of No. 2 Light Field Ambulance, long divorced from the Corps along with the 1st Armoured Brigade. His contention was that since this brigade always fought in conjunction with the infantry, its casualties could be cleared by the field ambulance serving the infantry; a small increment posted to brigade headquarters and each armoured regiment would provide an ample R.C.A.M.C. component. On the other hand, it was argued that fighting in the mountainous interior under command of the 13th Corps, the brigade would have been left entirely dependent on British medical facilities for the evacuation of its casualties beyond the regiment. The medical authorities both of the 13th Corps and of the Fifth Army objected so strenuously that the project was abandoned for the time being.

No. 2 Light Field Ambulance was withdrawn from the armoured brigade to the 1st Corps area at the end of November, presumably as the prelude to carrying out at last the desired disbandment. But for whatever reason nothing was done. About the middle of January 1945 it rejoined the armoured brigade with morale considerably lowered, most of its personnel being unaware that its seclusion had been a deliberate manoeuvre to save it from disbandment. Its ultimate complement was reduced by approximately half the manpower saving originally anticipated (of 13 officers and 346 other ranks) from a reorganization of the medical service. *

* Quarterly Report, D.D.M.S., 1 Cdn Corps, July - September 1944, *op cit.* is the principal source of information regarding this reorganization, including the expected manpower saving. See also the war diary of the D.D.M.S. and that of No. 2 Canadian Light Field Ambulance for the months September 1944 - January 1945.

The relatively small manpower saving actually achieved was at the expense mainly of the divisional field ambulances. As a result, divisional medical resources were reduced to the point where the A.Ds.M.S. considered them inadequate to meet normal commitments and at the same time provide a reserve. Specifically, both A.Ds.M.S. wanted an additional section of one stretcher-bearer officer and 10 other ranks added to each light field ambulance.* But apart from the stretcher-bearer officer, this reinforcement was refused.

The control of all field dressing stations by the D.D.M.S. during periods of active operations had proved very successful. As a permanent arrangement it left something to be desired, inasmuch as the divisional field dressing stations had been used extensively during periods of rest or of relative inactivity for the local treatment of minor sick.

The disbandment of one field dressing station was perhaps necessary if the 200-bed general hospital was to be secured again for duty with the Corps. There is room for belief that the D.D.M.S. was also influenced by the fact that in the particular circumstances of the attack through the Gothic Line it had proved advantageous to use his casualty clearing stations as advanced surgical centres. What is best in one situation is not necessarily best in all. To provide the seriously wounded with early surgical aid is a question of time rather than of space. Particularly in mobile operations surgical facilities will often be required further forward than casualty clearing stations can be moved in time. For this reason a generous allotment of field dressing stations is essential. In the Liri Valley, for example, there was one occasion on which five field dressing stations were fully employed, two open as advanced surgical centres, three holding post-operative cases.

It is to be noted, finally, that when the 1st Canadian Corps eventually joined the First Canadian Army in North-West Europe, it was ordered to undo all these organizational changes in its medical service.

Across the Savio

To return to the battlefield, the last day of September found the 1st Corps occupying positions along the southern bank of the Fiumicino River from the Adriatic inland, a distance of some four miles. No further progress was made for the next ten days. The Fiumicino, "normally a small, easily fordable stream, was, as a result of the heavy rains, a rushing torrent which presented a major bridging problem, while the new notorious mud rendered vehicle movement practically impossible, except on metalled roads". †

* 11 /AAI 5 Div/1: Quarterly Report, A.D.M.S., 5 Cdn Armed Div, October - December 1944, Appx B, A.D.M.S. to A.A. & Q.M.G., 28 September 1944.

† 11 /AAI 1 Corps /1 : Quarterly Report, D.D.M.S., 1 Cdn Corps, October - December 1944.

The distance between the front line and the casualty clearing stations was now such that on 1 October No. 13 Field Dressing Station and an attached surgical group opened in Rimini for Priority I and II casualties from the 5th Armoured Division. The 2nd New Zealand Division by this time had its own advanced surgical centre, located at the advanced dressing station of No. 4 New Zealand Field Ambulance. Priority III casualties from both divisions were all directed to No. 5 Casualty Clearing Station at Cattolica, since No. 4 had moved into billets in Riccione to make way for NO. 3 General Hospital. On 3 October the latter occupied the site thus made available. About it were soon grouped No. 1 Mobile Bacteriological Laboratory, the 250-bed detachment from No. 1 Convalescent Depot, No. 2 Exhaustion Unit, and the recently formed No. 2 Venereal Disease Treatment Unit. No. 1 General Hospital, and No. 1 New Zealand General Hospital at Senigallia, continued to receive any overflow of Priority III cases as well as all others evacuated beyond the Corps.

By the time the offensive was resumed on 10 October, the Canadian front had been extended to include the Rimini-Bologna Highway No. 9, the 1st Infantry Division had taken over this new left flank, the 2nd New Zealand Division had side-stepped to relieve the 5th Armoured and been replaced in turn on the coastal flank by a composite group known as "Cumberlandforce". The chief preparation on the medical side had been the opening on 6 October of a second advanced surgical centre in Rimini, based on No. 16 Field Dressing Station. No. 4 Light Field Ambulance had opened an advanced dressing station in Santarcangelo.

The 1st Infantry Division crossed the Scolo Rigossa and the Pisciatello Rivers in rapid succession. By 20 October it had cleared the northern part of Cesena and reached the line of the Savio River. To the right the 2nd New Zealand Division was also facing up to the Savio, while on the coastal flank "Cumberlandforce" had captured Cesenatico and was threatening Cervia.

Casualties remained light throughout this period, and as wounded were reaching the advanced surgical centres at Rimini in about four hours, there were no significant changes in the evacuation arrangements. The main point of interest was the opening on 19 October of No. 1 Mobile New Zealand Casualty Clearing Station near Bellaria. Though made responsible primarily for all New Zealand casualties, it treated a number of Canadians as well, its surgical potential being strengthened from No. 4 Canadian Casualty Clearing Station. The advanced dressing station at Santarcangelo cleared the 1st Division until the 16th. On that date No. 5 (Light) Field Ambulance opened in Savignano.

The Savio proved to be an almost insuperable obstacle, but by 24 October a small bridgehead north of Cesena was finally secured. The situation then eased suddenly. The enemy found it necessary to withdraw troops from his Adriatic front to counter the increasing threat being developed by

the Fifth Army against Bologna. This in turn necessitated his withdrawal from the line of the Savio. As a result the 1st Infantry Division reached the Ronco River by the 26th. The 5th Armoured Division, which on the 22nd had relieved the 2nd New Zealand, also crossed the Savio in strength and pushed forward to the Ronco. "Cumberlandforce", in the face of extensive flooding in the coastal sector, found itself unable to progress much beyond the Bevano River.

The heavy fighting along the Savio in the neighbourhood of Cesena, coupled with the distance back to Rimini, induced the transfer on 21 October of No. 16 Field Dressing Station and its attached surgical group from Rimini to Savignano, directly in rear of the 1st Division. To this advanced surgical centre most Priority I and II casualties from both Canadian divisions were directed during the balance of the October fighting. The Priority III patients continued to be evacuated either to No. 5 Casualty Clearing Station at Cattolica or to No. 1 Mobile New Zealand Casualty Clearing Station near Bellaria. Sites for a casualty clearing station were selected and prepared both in Cesena and in Cesenatico, so that in the event of a substantial advance on either flank No. 4 Casualty Clearing Station could be moved rapidly from Riccione, where it had remained relatively inactive since the beginning of the month.

Actually neither site was required immediately for operational purposes. Having reached the Ronco, the 1st Canadian Corps was relieved by "Porterforce", a mixed battle group similar to "Cumberlandforce", and was withdrawn for a well-deserved rest. When No. 4 Casualty Clearing Station moved to Cesenatico on 29 October it was for the purpose chiefly of opening a combined medical and surgical centre for the troops resting in that area. The most forward medical installations when the relief of the Corps began on 28 October were the advanced dressing stations of Nos. 9 and 24 (Light) Field Ambulances, the former at Cesena, the latter near Mensa. By the time the relief was completed, No. 7 Light Field Ambulance had opened to the north-west of Cervia in support of "Porterforce".

A Month of Rest

Apart from the elements attached to "Porterforce", the 1st Canadian Corps spent the month of November in comparative tranquility, recuperating from past experiences and preparing against those yet to come. "The inclement weather made it imperative that the troops, who had up to this time been living in the open or under canvas, be housed in billets".* As this type of accommodation was extremely scarce, the Corps was widely scattered from Urbino to Cervia. This in turn necessitated a considerable dispersion of medical facilities. No. 4 Casualty Clearing Station, with an attached surgical group, remained open in Cesenatico as a medical and surgical centre, while No. 5, with the other surgical group plus a British field surgical

* *Ibid.*

unit, functioned similarly at Cattolica. No. 3 General Hospital, where there was accommodation for 400 patients, acted as a purely medical centre to the north-west of Cattolica. Minor sick in both divisions were retained for treatment by their own field ambulances. Medical units not actively employed, notably the field dressing stations, were as far as possible grouped together for billeting purposes so as to ease the accommodation problem.

Though by no means the principal cause of illness during this period, diphtheria appears to have created the most concern. It had become evident during October that an increase in the incidence of this disease might be expected, for in the week ending 21 October cases were reported in all Canadian formations for the first time since the previous April. Diphtheria was prevalent among the civilian population of the whole coastal sector occupied by the Canadians, and contact with it was inevitable. The first week in November saw a 300 per cent increase in cases over the previous week, and by the 11th 51 cases had been reported from 35 different units. As a precautionary measure, it was arranged early in November that all throat cases should be evacuated to No. 3 General Hospital for diagnosis. An immunization programme was also decided upon, but this had been started in only one brigade per division and in the corps artillery when the entire Corps was again committed to action, completely interrupting the procedure. However, up to 31 December only 170 Canadian cases of diphtheria developed.*

Venereal disease also created serious problems again. As an experimental supplement to the preventive measures already instituted, a special educational exhibit was set up for a full week during November. A special clinic was opened for taking voluntary blood samples. The exhibit and the clinic were well patronized. "In spite of all these measures, the incidence of infection continued to rise steadily as more men were given leave". †

Medical arrangements for "Porterforce", though it was under the direct control of the Eighth Army for operational purposes, were a Canadian responsibility. Field ambulance facilities were provided on the right flank by No. 7 Light Field Ambulance and on the left by No. 4 (Light) Field Ambulance. The commanding officer of the latter acted as senior medical officer, co-ordinating all evacuation arrangements. These became very complicated at times because of torrential rains, flooded roads, and washed-out bridges. DUKWs, assault boats, breeches-buoys, and rafts had all to be resorted to at one time or another. For varying periods, sections from a British and No. 8 Canadian Light Field Ambulances also operated with the force. Beyond the advanced dressing stations, so far as possible, British casualties were cleared to medical installations of the 5th Corps, while Canadians were directed to their own, in the main to No. 4 Casualty Clearing Station at Cesenatico. The means of transport, irrespective of nationality, was provided by No. 1 Canadian Motor Ambulance Convoy.

* *Ibid.* See also, W.D., D.D.M.S., 1 Cdn Corps, November 1934, Appx 2.

† Quarterly Report, D.D.M.S., 1 Cdn Corps. October - December 1934, *op cit.*

The December Battles

While the 1st Canadian Corps rested, the 2nd Polish and the 5th British Corps continued to press forward along the axis of the Rimini—Bologna highway despite the weather and the difficult terrain. By the end of November the left flank of the Eighth Army rested on the Lamone River to the north-west of Forli. In the coastal sector, "Porterforce" had succeeded in reaching the southern banks of the Montone and the Fiumi Uniti.

It had been decided meanwhile that early in December the Eighth Army should make an all-out effort to reach the Santerno River, preparatory to undertaking a joint offensive with the Fifth Army before winter finally rendered large-scale operations impossible. The 1st Canadian Corps accordingly returned to the line on the night of 1-2 December, prepared to carry out Operation "Chuckle". It was to cross the Montone through the 10th Indian Division's bridgehead, then fan out, the 1st Infantry Division to the north-west to force the Lamone River east of Lugo, the 5th Armoured to the north-east to outflank Ravenna.

Medical preparations were governed largely by several complicating factors: the evacuation difficulties inherent in the canalized terrain, the long and precarious maintenance routes to be travelled by ambulance cars, the bad weather, and the road distance of some 75 miles that now intervened between the most forward casualty clearing station and No. 1 General Hospital at Iesi.

Because it was impossible initially to site a casualty clearing station in front of Cesenatico, advanced surgical centres based on Nos. 1 and 16 Field Dressing Stations were established in proximity to the road joining Forli and Ravenna, which in the Canadian sector closely paralleled the Ronco River and linked the "up" and "down" routes. No. 16 was sited west of the river on the "down" route. No. 1, located east of the river on the "up" route in order to obtain covered accommodation, was less advantageously placed from the point of view of accessibility, but this problem was overcome by obtaining unrestricted running rights for ambulance cars over the "up" route as far as the Forli-Ravenna Lateral. No. 2 Field Dressing Station took possession of a building in Cervia that had been reserved for occupation by a casualty clearing station at a later date, and prepared to open there if necessary. No. 13 Field Dressing Station, in Rinlini, remained closed as a reserve.

No. 4 Casualty Clearing Station at Cesenatico was strengthened by two surgical teams provided from the base hospitals. Medical cases on hand were evacuated and arrangements made to clear any fresh ones received, since Priority III battle casualties were to be retained for treatment up to the limit of the unit's capacity. No. 3 General Hospital set aside 100 beds as an isolation ward for suspected and actual diphtheria cases and prepared the remaining 300 for any overflow of battle casualties. The surgical staff was increased by two surgical teams from the base, one Canadian, one British,

and all medical cases except those in the isolation ward were evacuated. NO. 5 Casualty Clearing Station was closed, but kept for the time being in Cattolica. Should the opening phase of the attack meet with stiff opposition, it would open in Cervia to ease the load on No. 4. In the event of a rapid advance it could be employed more usefully in either Ravenna or Russi.

The attack was launched on the morning of 2 December. The 1st Infantry Division passed through the 10th Indian Division and pushed on towards Russi against moderate opposition. That place fell on the 3rd, and the next morning the division reached the Lamone River. But a bridgehead secured on the 5th was wiped out by heavy counter-attacks. The 5th Armoured Division, meanwhile, had succeeded in its task of outflanking Ravenna. Two battalions of the 12th Canadian Infantry Brigade crossed the Montone through the 10th Indian Division's bridgehead and then swung to the right to link up with an assault crossing by the Westminster Regiment in the vicinity of S. Pancrazio. From this second bridgehead the division drove north and east to cut Highway No. 16. On 5 December it reached the Lamone at Mezzano and linked up with the 1st Division on its left. Ravenna itself had been occupied the day before by "Porterforce".

No. 9 (Light) Field Ambulance, with its advanced dressing station midway between the Ronco and Montone Rivers, cleared the 1st Division until 4 December, also the two battalions of the 12th Infantry Brigade that passed through 10th Indian Division. On the other flank No. 8 Light Field Ambulance, sited just over the Ronco River to the south-east of S. Pancrazio, covered the assault of the Westminster Regiment and began to receive all casualties from the 5th Armoured Division as soon as a bridge was completed over the Montone. As both advanced dressing stations were close to the advanced surgical centres, the majority of Priority I and II casualties were received there within about two hours of wounding. On the 4th, Nos. 4 and 24 (Light) Field Ambulances opened west of the Montone, the former in Russi, the latter about one mile north of S. Pancrazio. Next day an advanced surgical centre was established by No. 2 Field Dressing Station at Russi to serve both divisions. There was thus little difficulty in handling the heavy casualties suffered by the 1st Division on the 5th. Russi, in fact, was so close to the front line at this time that the dispatch of nursing sisters to the advanced surgical centre had to be delayed. The other problem was the evacuation of Priority III casualties. Until a route through Ravenna could be opened, these had to travel to No. 4 Casualty Clearing Station at Cesenatico over the roundabout route of the Corps' advance. In the case of the 5th Armoured Division, the time element involved was as much as eight hours by 5 December.

The assault across the Lamone was delayed by bad weather until the night of 10-11 December. In the interval medical arrangements were altered slightly. No. 24 (Light) Field Ambulance moved its advanced dressing station to Piangipane on the 6th. On the following day No. 5 Casualty

Clearing Station moved into Ravenna, with two field surgical units attached, to become the advanced surgical centre for the 5th Armoured Division. On the 7th, also, it became possible to route Priority III cases to Cesenatico through Ravenna. This reduced to one and a half hours the ambulance journey from the 1st Division's open advanced dressing station to No. 4 Casualty Clearing Station.

Following the successful crossing of the Lamone by both divisions on the night of 10-11 December, there was bitter fighting for a firm foothold on the west bank of the Canale Naviglio, which was not attained until the afternoon of the 15th. Casualties for the five days totalled 200 killed and 671 wounded. During the next three, as the divisions prepared for a further effort, there were 71 killed and 281 wounded. Medical personnel engaged in collecting wounded in the forward area were frequently under fire. Both medical installations in Russi were shelled. Before bridges were thrown over the Lamone, casualties had to be rafted across in assault boats. Despite these difficulties, the evacuation system functioned smoothly. Up to 19 December the only important change was the dispatch of No. 7 Light Field Ambulance to reinforce No. 24's advanced dressing station at Piangipane. By the 19th, it had become necessary to close the medical installations in Russi because of increasingly intense enemy shelling. On that day No. 13 Field Dressing Station established in Ravenna an advanced surgical centre for the 1st Division, while to relieve No. 4 (Light) Field Ambulance, No. 5 opened well clear of Russi along the main road to Ravenna.

This minor readjustment of medical dispositions coincided approximately with the launching of what proved to be the last important Canadian operation in Italy. On the evening of 19 December the Corps attacked from its Naviglio bridgehead on a two-division front. Despite stubborn opposition, especially along the Fosso Munio, the enemy had been driven back roughly to the line of the Senio River by the 21st. With the rest of the month devoted to mopping-up operations, the end of the year found the 1st Canadian Corps firmly established along the Senio from approximately Cotignola on the left to Alfonsine on the right.

Casualties for the first three days of this final phase of the advance to the Senio totalled 97 killed and 295 wounded, for the balance of the month 75 killed and 413 wounded. On 23 December No. 7 Light Field Ambulance opened along Highway No. 16 in the vicinity of Mezzano, and took over the responsibility of clearing the 5th Armoured Division from No. 24 at Piangipane. No. 5 (Light) Field Ambulance remained east of Russi as the forward advanced dressing station of the 1st Division. With good road communications back to the advanced surgical centres in Ravenna and thence to No. 4 Casualty Clearing Station at Cesenatico and No. 3 General Hospital south-east of Riccione, no advantage was to be gained by altering the chain of evacuation at the Corps.

The Canadian Hospitals, August - December 1944

From the beginning of the attack on the Gothic Line until the end of December, indeed until the departure of the 1st Corps from the Italian theatre in February 1945, the locations of Nos. 1, 5, 14, and 15 General Hospitals remained unchanged.

The original intention had been to have two of them in the area of Florence, but the decision to employ the 1st Canadian Corps on the Adriatic front had altered this. No. 1 General Hospital, while preparing early in August to open at Arezzo to the south-east of Florence, was suddenly ordered to Macerata, some 20 miles to the south of the port of Ancona. There it operated on a temporary basis for about a week before moving northward to Iesi, No. 14 was sited at Perugia for the lack of any other accommodation. Ancona would have been the most logical place for it, but was found to be too shattered. Elsewhere on the east coast there was not a suitable location remaining. As the campaign progressed, consideration was given to the possibility of moving No. 5 from Rome to the Adriatic coast somewhere in the Cattolica-Rimini area. But this resulted in nothing more than tentative reconnaissances, apparently because the accommodation available was considered unsuitable for a 600-bed hospital. No. 15 remained at Caserta for the sole but important reason that a large Canadian hospital was required in the advanced base area. Naples was the port of evacuation for casualties and the port of arrival for reinforcements. The Canadian Base Reinforcement Group was located at Avellino, No. 1 Convalescent Depot at Mercatello. Only in the event that the advanced base itself had been moved could No. 15 justifiably have been taken from Caserta.

As a result of these special and largely unavoidable circumstances, the geographical relationship of the Canadian hospitals to each other and to the scene of Canadian operational activity was far from ideal during the period from August to December 1944, and remained so to the end of Canadian participation in the Italian campaign. No. 1 General Hospital had to function as a large casualty clearing station, receiving the casualties evacuated from the 1st Corps and passing them on to one of the other hospitals as rapidly as possible after preliminary treatment. Its ability to continue in this role for any length of time, and hence the successful functioning of a whole system, depended entirely upon the existence of adequate facilities for casualty evacuation from Iesi to Perugia, Rome, or Caserta. Road, air, rail, and even sea evacuation were employed at various times, singly or in combination. None of these methods was entirely reliable, but together they met the need. The margin of safety was nevertheless small, and the danger of a crisis was never far removed.

From 22 August to the end of September, No. 1 General Hospital admitted a total of 6325 patients, 5720 of them Canadians. Had there not been an excellent system of air evacuation to Nos. 5 and 15 General Hospitals

this large influx of casualties could never have been handled, for the only other means of evacuation was by road to No. 14 at Perugia. An equally difficult problem was the provision of surgical attention for the large number of battle casualties, about 60 per cent of which required surgical treatment over and above that already received in the forward area. It was solved by the attachment for varying periods of two British field surgical units and of surgical teams from No. 15 General Hospital and No. 5 Casualty Clearing Station. Counting the three organized from its own staff, the hospital had five surgical teams available at all times during September. With these working in shifts, the operating room was kept functioning 24 hours a day, and 1799 operations were performed.*

In October, due to the lessened activity of the 1st Corps, there was a definite and fortunate slackening in the rearward flow of casualties. Air evacuation from Iesi had become more and more difficult owing to deteriorating weather conditions, and early in the month had to be discontinued altogether. Road evacuation to Perugia was still reliable, but only a limited number of patients could be cleared by this method, as No. 14 was having trouble evacuating to Rome and Caserta because of washouts on the railway lines. By 10 October there were over 660 patients on hand. Arrangements were accordingly completed for a large-scale evacuation by hospital ship via Ancona to Bari, thence by ambulance train to Caserta. This remained the principal method of evacuation for the balance of the month. Not until the 25th did the first ambulance train leave Iesi. The number of patients on hand hovered consistently around the 600 mark, and several times threatened to exceed the hospital's utmost capacity.

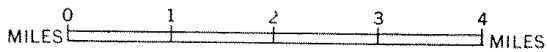
November produced similar difficulties, but with the 1st Corps in reserve there were fewer patients to deal with and less necessity of keeping beds free for battle casualties. Days of heavy and continuous rain washed out a number of bridges along the road and rail evacuation routes, and sea evacuation via Ancona and Bari had to be resorted to on three occasions. In December, ambulance train service from No. 1 to Nos. 5 and 15 General Hospitals became more regular and reliable. The more than 3000 Canadians admitted during December appear to have been handled without particular difficulty. In fact, discharges and transfers exceeded admissions, leaving more beds empty at the end than at the beginning of the month.

In the above circumstances an even distribution of patients was impossible. No. 14 was sometimes completely filled; at other times it had empty beds because of the severance of road communications with Iesi. Despite a capacity of over 1600, No. 15 could not handle all the patients directed to it, especially during September and October, with a consequent overflow into British hospitals in the Caserta area. No. 5, on the other hand, was not hard pressed at any time after the middle of August. These points

* 11 /AAI 1 GH /1 : Monthly Statistical Returns, I C.G.H., August, September 1944. See also W.D., I C.G.H., September 1944.

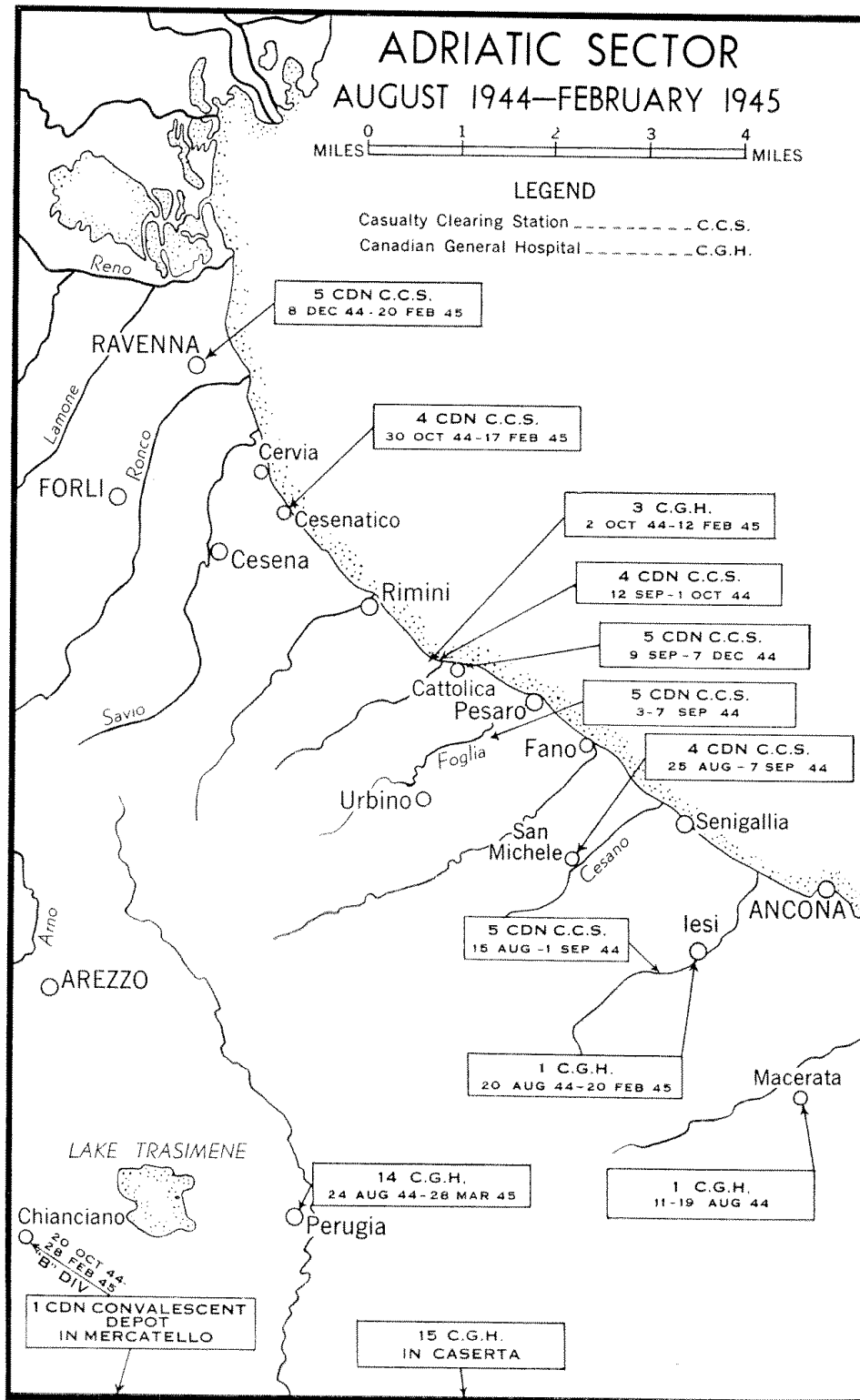
ADRIATIC SECTOR

AUGUST 1944—FEBRUARY 1945



LEGEND

Casualty Clearing Station ----- C.C.S.
 Canadian General Hospital ----- C.G.H.



are illustrated by the accompanying table of hospital admissions for the period August - December 1944.

| | <i>Total Admissions</i> | <i>Average Bed Capacity</i> | <i>Average Bed Occupants</i> |
|-------------------|-----------------------------|---------------------------------|----------------------------------|
| No. 1 C.G.H..... | 14,771 | 600 | 480 |
| No. 5 C.G.H..... | 4,845 | 600 | 473 |
| No. 14 C.G.H..... | 7,565 | 1,187 | 887 |
| No. 15 C.G.H..... | 9,178 | 1,656 | 1,389 * |

No. 14 General Hospital, though a 1200-bed unit, functioned largely as a lines of communication hospital. Only from about the middle of October did it undertake to a limited extent the definitive treatment of long-term cases. This was facilitated, though by no means dependent on, the establishment during October of one division of No. 1 Convalescent Depot at Chianciano, some 25 miles due west of Perugia. Previously, recovered patients had been either returned directly to the 1st Corps or transferred to a British convalescent depot in the Perugia area. The majority of long-term cases reached No. 15 General Hospital, whence patients were discharged directly to the reinforcement stream via Avellino or first to the main convalescent depot at Mercatello.

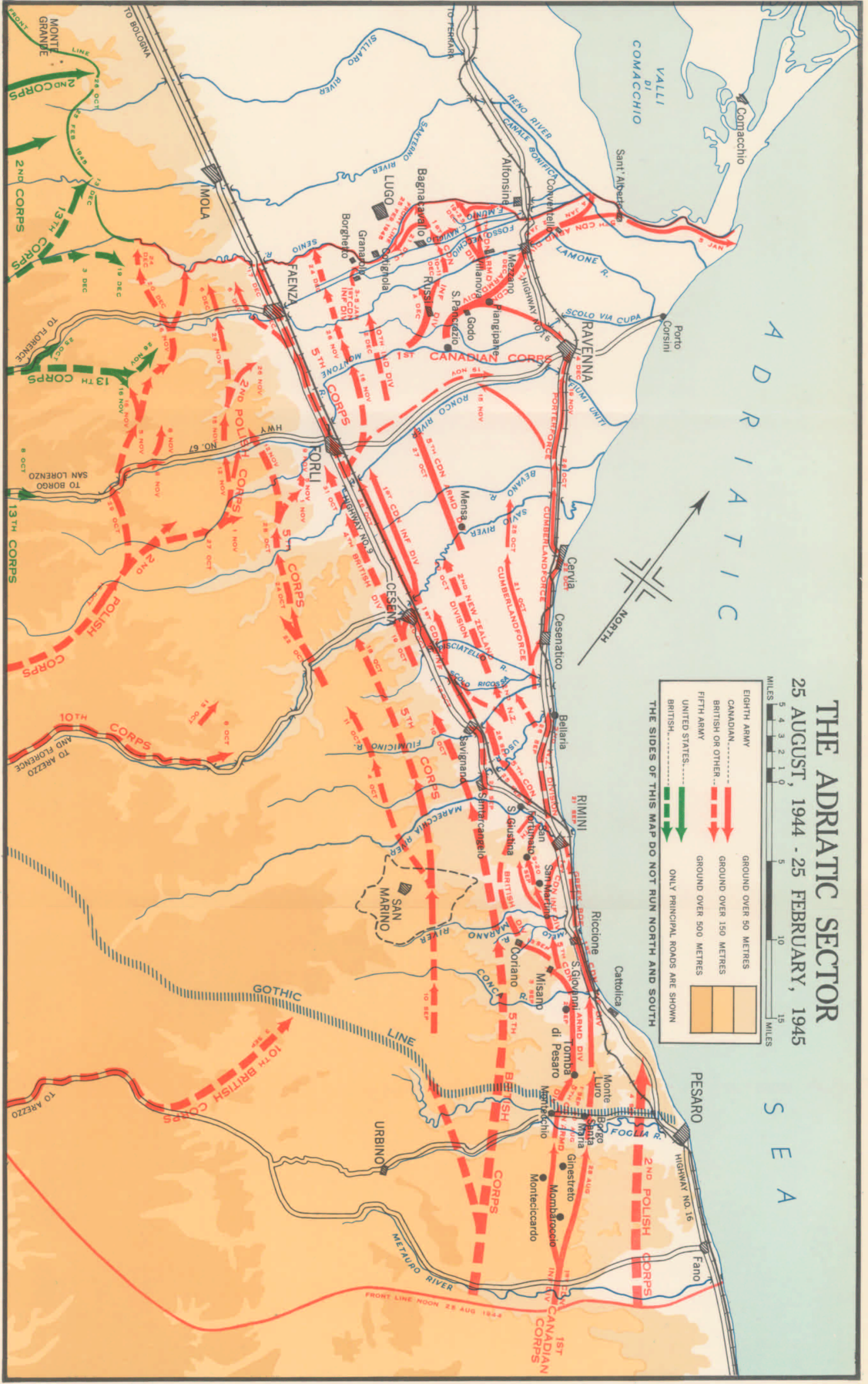
The Canadian Departure From Italy

Early in January 1945, in accordance with a decision to bring Eighth Army operations to a halt for the winter along the line of the Senio, the 1st Canadian Corps carried out two minor operations to consolidate its position. Thereafter the front became static. The 5th Armoured was replaced on the right flank by an Italian formation, the Gruppo Cremona. The 1st Infantry remained in the line, but it was assisted successively by the 9th and 2nd British Armoured Brigades in the role of infantry, and thus enabled to provide periods of rest for its units. In February the 1st Corps set out to join the First Canadian Army in North-West Europe.

Except that the D.D.M.S. came eventually to control a mixture of Canadian, British, and Italian medical units, little occurred during these last two months in Italy that is of interest to the history of the medical services. If battle and non-battle casualties together could not be described as light, neither were they especially heavy. With a few minor modifications, the scheme of evacuation in effect when the Corps reached the Senio sufficed for the whole of the subsequent period of static warfare.

News of the impending move was received by the D.D.M.S. at the end of the first week in February. Preparations were immediately put in hand for all open medical units to evacuate as many as possible of the patients on hand and to turn over their operational commitments and any remaining patients to relieving units. On the 13th, by which date elements of the Corps

* Compiled from monthly returns submitted by the hospitals concerned, to be found on II/AAI GH/1,11/AAI 5 GH/1,11/AAI 14 GH/1,II/AAI 15 GH/1.



THE ADRIATIC SECTOR

25 AUGUST, 1944 - 25 FEBRUARY, 1945

5 4 3 2 1 0
 MILES 5 10 15
 5 4 3 2 1 0
 KILOMETRES

- EIGHTH ARMY
 - CANADIAN: - - - - -
 - BRITISH OR OTHER: - - - - -
 - FIFTH ARMY: - - - - -
 - UNITED STATES: - - - - -
 - BRITISH: - - - - -
- GROUND OVER 50 METRES
 GROUND OVER 150 METRES
 GROUND OVER 500 METRES
- ONLY PRINCIPAL ROADS ARE SHOWN
- THE SIDES OF THIS MAP DO NOT RUN NORTH AND SOUTH

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Compiled and drawn by Historical Section, G.S.

had already started on the long journey through Italian ports to Marseilles and thence to a concentration area in Belgium, medical responsibility for the Adriatic sector of the Italian front passed to the D.D.M.S., 5th Corps. Shortly thereafter all casualties from the 1st Infantry Division were directed to British medical installations in Ravenna and Forli so as to release the Canadian non-divisional medical units still open. This arrangement remained in effect until the relief of the 1st Division was finally completed on 27 February.

Responsibility for the move, medical and otherwise, rested entirely with the Headquarters of the 15th and 21st Army Groups. It will therefore suffice to note that casualties en route were evacuated to the nearest British, American, or Canadian hospital, either directly by the unit concerned or through the medical inspection rooms and camp reception stations located at the various staging points along the roads and railways. In France, particularly, beginning with the staging camp at Marseilles, there was an elaborate network of these small installations, which were supplemented by ambulance car posts at strategic points and backed by the numerous American hospitals scattered between Marseilles and Brussels. Canadian medical personnel, and even units, were employed at the discretion of the authorities concerned to augment the resources available locally.

The leading units of the Corps began to arrive in Belgium during the last week of February. By special permission of Headquarters, 21st Army Group, regimental medical officers initially evacuated their sick and injured by unit transport directly to whatever hospital was most convenient. No. 4 Casualty Clearing Station arrived on 9 March and immediately opened in the Corps Troops concentration area. As elements of No. 1 Motor Ambulance Convoy had also arrived by this time, it was soon possible to establish once again a co-ordinated chain of evacuation, which led at first through No. 4 Casualty Clearing Station to No. 2 General Hospital at Ghent.

No. 3 General Hospital moved to North-West Europe with the Corps Troops. Nos. 1 and 5 followed soon afterwards. Nos. 14 and 15 and No. 1 Convalescent Depot remained in Italy until almost the end of March, and then proceeded to the United Kingdom. There, in May, all three units were disbanded. No. 28 General Hospital (200 beds), which in January 1945 had been authorized as an expansion of No. 1 Field Hospital, remained at Avellino until the middle of April. It was then disbanded and its personnel returned to the United Kingdom as reinforcements. The closing and moving of these hospitals was under the direction of Allied Force Headquarters and was effected through British channels. The problem of clearing Canadian patients from Italy before the hospitals departed was largely solved by increasing the space allotment for Canadians on ambulance trains running between forward and base hospitals and on hospital ships proceeding to the United Kingdom. When the last Canadian hospital closed the comparatively few Canadian patients remaining were turned over to British installations.

THE INVASION OF NORMANDY, JUNE 1944

From the time of the arrival of the first Canadian units in England in December 1939, the object of the Canadian Army was to assist in the defeat of the German military machine on the continent of Europe. Developments on the Continent which forced Britain into a defensive position made it necessary to change the role of the Canadian Army during its first two years in Britain, but the main object was kept continually in view. By March 1942 the immediate danger of an invasion of Britain had passed; the situation had so far changed that the project of a full-scale invasion of Europe again became feasible. In April the British and American leaders decided that an attack across the English Channel should be the principal offensive effort in Europe of the two governments, and that the attack should be launched at the earliest possible moment.* The Dieppe raid of 19 August fitted into this picture as it showed the necessity of developing new techniques to deal with landing a large force on a heavily defended enemy coast, and in a very definite sense it may be said that it marked the beginning of the road that led to Operation "Overlord". However, the dispatch of forces to the Mediterranean theatre later in 1942 for the invasion of French North Africa forced a postponement of the assault on North-West Europe, which had been looked for in 1943, and plans for the new invasion scheme were made with 1944 in view as the invasion year.

INVASION PLANS AND PREPARATIONS

In April 1943 Lieutenant-General F. E. Morgan began work in London on detailed plans for the invasion of Europe under a directive from the Combined Chiefs of Staff, as Chief of Staff, Supreme Allied Commander (COSSAC), although the supreme commander had not yet been appointed. By July 1943 General Morgan and his staff had completed an outline invasion plan which proposed an assault across the Channel by three seaborne divisions. This plan was approved by the "Quadrant" conference at Quebec in August but was to undergo many changes before D Day, the day set for the invasion. On Christmas Eve President Roosevelt announced the appointment of General Dwight D. Eisenhower, Commander in Chief in the Mediterranean theatre, as Supreme Commander, Allied Expeditionary Forces. Within a month Eisenhower had his new headquarters functioning in London. Air Chief Marshal Sir Arthur Tedder was designated as his deputy. Admiral Sir Bertram Ramsay became Allied Naval Commander, Expeditionary Force, and Air Chief Marshal Sir Trafford Leigh-Mallory became Air Commander-

* Eisenhower, Dwight, D. *Crusade in Europe*, p. 48.

in-Chief, Allied Expeditionary Force, while General Sir Bernard Montgomery, Commander of the British 21st Army Group, was detailed to command all the ground forces taking part in the initial assault.

The new High Command (Supreme Headquarters, Allied Expeditionary Forces — soon known as SHAEF) immediately undertook to broaden the plan submitted by General Morgan so that when it became final it envisaged an attack not by three but five seaborne divisions which would be followed during the build-up phase by a further 24 divisions, supplied initially over the assault beaches and from artificial harbours.

The new plan for "Overlord" broadened the front of attack so that it reached from the base of the Cherbourg peninsula to the Ouistreham area at the mouth of the Orne River below Caen. The United States First Army was to land on the right and the British Second Army on the left. The two armies were to be under General Montgomery's command for the assault, but when a sufficient force for the breakout had been assembled in the bridgehead, each army was to come under its own commander who would report directly to General Eisenhower.

Although the First Canadian Army, as such, was to come ashore after the bridgehead was secured this did not mean that the Canadians were to be entirely denied a place in the initial landings, for as early as July 1943 it had been decided that at least one Canadian division should take part in the assault. The 3rd Canadian Division was selected for this task and placed under 1st Canadian Corps for training. With the departure of the 1st Canadian Corps for Italy in the autumn of 1943 this infantry division continued its training under the 1st British Corps. The 3rd Canadian Division with supporting regiments of the 2nd Canadian Armoured Brigade was to take part in the initial landing as part of the British Second Army, while the First Canadian Army would provide part of the follow-up force to be used for the "breakout" from the bridgehead. This meant that the first Canadians ashore would be those of the 3rd Division and that when the bridgehead was large enough the 2nd Canadian Infantry and 4th Canadian Armoured Divisions would come into battle, while 2nd Canadian Corps Headquarters and First Canadian Army Headquarters would take over immediate direction of Canadian forces on the Continent.

The front to be attacked by the British Second Army lay roughly between Bayeux and the mouth of the river Orne. The 30th British Corps directed the right sector, with one division, the 50th (Northumbrian), assaulting; the 1st British Corps had the left with two divisions assaulting - the 3rd Canadian Division supported by the 2nd Canadian Armoured Brigade to the west and the 3rd British Division to the east. The Canadians were thus in the Centre of the British front. Their role was to push forward between Bayeux and Caen, while the British divisions on the flanks took these two towns. It was hoped that by evening of D Day both would be in our hands, and that the Canadians would be in a position astride the main road and

railway connecting them.* The First Canadian Army as part of the 21st Army Group and the 3rd Canadian Division in the initial assault were expected to play an important part in the drama which was soon to unfold. The Combined Chiefs fixed the "target date" for Operation "Overlord", as it was now known, at 1 May 1944, but this date was several times post-poned, being finally fixed at 6 June.

21st ARMY GROUP MEDICAL PLAN FOR OVERLORD

For D Day and until hospital accommodation was adequate for retention of casualties, the 21st Army Group medical plan was based on the evacuation to the United Kingdom of all casualties except those whom it was dangerous to move, and the provision of life-saving surgery by the medical units in the beach organizations. As soon as hospital accommodation ashore was adequate, all cases requiring not more than seven days treatment were to be retained on the Continent. As the build-up of hospitals permitted, this period was to be extended to 15 days, 30 days, and ultimately to much longer periods as the Army Group Commander decided. L.S.Ts. (Landing Ship Tanks) and hospital carriers were to be used for evacuation over the beaches and from artificial ports, and hospital ships were to be used for evacuation from major ports.

When the progress of operations and the build-up permitted, the medical services were to be organized on the standard layout. Advantage was to be taken of the port of Cherbourg, when captured, for the evacuation of casualties by hospital ship, and air evacuation was to be used when practicable. Ambulance trains were to be brought to the theatre as early as port facilities and railway communications permitted. Initially, the maintenance of medical supplies was to be by means of Bricks† brought in over the beaches. As soon as shipping permitted, advanced depots of medical stores were to be established.

Casualties were divided into three classes: drowned; sick and non-battle casualties; and battle casualties. It was anticipated that of craft which became lost or damaged 60 per cent would be lost or damaged on the outward journey, i.e., when loaded. In craft which were total losses 70 per cent of passengers would become casualties. Thus 42 per cent (70% of 60%) of personnel carried by lost craft would become casualties. In craft which were damaged 20 per cent of passengers would become casualties, i.e., 12 per cent (20% of 60%) of personnel carried in damaged craft would become casualties. It was assumed that 0.17 per cent of the total force ashore would be sick or hospitalized. Battle casualties were estimated on the following scale:

* Stacey, C. P. *The Canadian Army*, p. 175.

†A medical beach maintenance block containing two packages of 25 cwt each of medical equipment, each package to contain about 47 boxes and bales (W.D., A.D.M.S., 3 Cdn-Inf Div).

| Type of Formation | Light Battle Day % | Severe Day % | Maximum Day % |
|---|-----------------------|-----------------|------------------|
| Brigade | 2.50 | 15.00 | 25.00 |
| Division | 1.00 | 8.00 | 15.00 |
| Corps | 0.50 | 3.00 | 5.00 |
| Army..... | 0.35 | 1.00 | 2.50 |
| L. of C. and service units not included in other estimates | 0.25 | 0.60 | |
| These estimates were subdivided as follows: | | | |
| (a) D Day and D plus 1 | | | |
| Killed, captured, missing..... | | 30% | |
| Wounded | | 70% | |
| (b) D plus 2 and thereafter | | | |
| Killed, captured, missing..... | | 25% | |
| Wounded | | 75% | |

Estimating casualties on the basis of 70,000 British-Canadian personnel ashore on D Day, total casualties for the day were estimated at 6250 of whom 4495 would require medical attention.

The basic principle adopted was that the Army accepted responsibility for collection, treatment, and evacuation of all casualties occurring on shore, including prisoners of war, assisted by such medical units and resources as the Royal Navy and the Royal Air Force might provide. Casualties occurring at sea were a naval responsibility, but arrangements were made to distribute regimental stretcher bearers and medical corps personnel among the various craft so that they could assist in the treatment of casualties until they were handed over to the naval authorities.

Casualties in the first flights of assault craft were to remain in the craft and be returned to the parent ship. Craft not operationally loaded were to rescue personnel from sunken craft, and these were to be returned to the parent depot ship sick bay if wounded. On shore no attempt was to be made to evacuate casualties until the beachhead was secure and cleared of the enemy. During this phase casualties were to be given first aid treatment, cleared off streets, roads, track and beach exit areas, and "nested" in protected areas in the region of regimental aid posts. Following the initial assault, a beach sub-area consisting of a headquarters and two beach groups were to be established ashore. The medical components of each beach group were to set up beach dressing stations (formed by the light section of a field dressing station), a field dressing station, an advanced surgical centre and a casualty evacuation point. All "nested" casualties and those in the immediate hinterland were to be collected into beach dressing stations. The walking wounded were to make their own way, under direction, to these stations. As the fighting moved inland and the advanced surgical centres came into operation, all casualties of the beach dressing stations requiring urgent surgery were to be sent to the advanced surgical centres. By this time, it was anticipated that a normal system of evacuation would be established, and that all casualties inland from the beaches would be evacuated to either the surgical centres or

the field dressing stations as their condition warranted. Meanwhile the casualty evacuation point was to be established and held in readiness for the evacuation of casualties by DUKWs to medical L.S.Ts. or with favourable tides to hospital carriers. The headquarters and reserve companies of the assault field ambulances were to follow the fighting troops inland. To transport casualties from the beachhead it was planned to use 70 L.S.Ts. which had been converted into stretcher carriers. Naval medical crews were to man half these vessels and army medical personnel were to provide the staffs for the other half.* When the L.S.T. or hospital carrier was loaded it was to proceed to a port or "hard" (beach landing point) in England from which the casualties would normally be taken to a transit hospital by hospital train. If the case were urgent the casualty might be held at a port or coastal hospital where landed, or transferred to a transit hospital by road. From the port and transit hospitals the casualties were to be taken to base or general hospitals for treatment. Coastal hospitals at ports designated for regular medical disembarkation were normally to receive only cases unfit for transport to transit hospitals, and local air raid casualties. Coastal hospitals at other points were to handle casual evacuations† from overseas and local air raid casualties. Transit hospitals were to act almost as casualty clearing stations. Their function was to receive casualties who in most cases would have had only first aid treatment, and give them food, rest, examination, redressing, and, if possible, surgical treatment. In order to keep these hospitals functioning in their role as clearing centres it was necessary to exercise discretion in the selection of cases for surgery. All less urgent cases were to be moved on to base hospitals as quickly as possible. Base hospitals were to take third priority patients, i.e., those who could stand a journey of up to six hours before requiring treatment, and those who were fit to be moved after treatment at a coastal or transit hospital.

A schedule of train departures was drawn up so that casualties would move swiftly from ports to transit hospitals and transit to base hospitals. There were to be 30 hospital ambulance trains. Ministry of Health provided crews for 12 trains, War Office for three, and U.S. Force for 15.

It was anticipated that there might be 4800 casualties in the British-Canadian sector during the first 24 hours and provision was actually made to handle up to 5500 distributed as follows:

| | |
|--|------|
| Detained at ports and coastal hospitals..... | 400 |
| Distributed by road..... | 600 |
| Distributed by hospital train to transit hospitals, i.e., 15 trains of 300 each | 4500 |
| TOTAL..... | 5500 |

* Canadian hospitals were asked to provide six medical teams. Each team consisted of three medical officers and 30 other ranks.

† Patients arriving in non-medical vessels.

From the transit hospitals 70 per cent of admissions were expected to be ready for evacuation to base hospitals within 24 hours; this was to be carried out by rail. Road transport was to be provided by Emergency Medical Service ambulances to carry casualties from coastal to transit hospitals when they were fit to travel. They might also be used if necessary to assist in the movement of casualties from transit to base hospitals.

CANADIAN MEDICAL PLAN

Canadian medical planning for the campaign began actively in May 1943. The problems encountered by the Canadians were numerous and in some sense more nearly like those of the American Army than the British forces with which the Canadians operated. The Canadian Army was, like the American, based in North America rather than England, and this made it necessary for the Canadians to have their decisions "firm" early enough to allow the necessary transportation to be arranged. Provision had to be made for evacuating Canadian casualties from the scene of operations back to England and for treatment and sufficient accommodation to permit retention of those destined for Canada until shipping was available to carry them home. This problem was further complicated by the possibility that the hospitals standing by in England to proceed to the Continent might be forced to accept casualties evacuated from France because of a lack of space in the bridgehead for the erection of hospitals.

In addition, the desire to have Canadian casualties treated in Canadian hospitals and returned to Canadian units at the earliest possible moment introduced a further complicating factor. The Canadians were operating in close co-operation with the British and the evacuation of Canadian casualties through British channels to Emergency Medical Service hospitals in England might unnecessarily delay the return of Canadians who had recovered and were fit to proceed as reinforcements.

Like the fighting forces, the Canadian medical services were closely integrated with those of 21st Army Group, especially during the early stages when it was necessary that every resource should be put to use without any unnecessary overlapping or duplication of effort. Brigadier Luton, the Director of Medical Services at C.M.H.Q., was in close touch with the War Office as well as National Defence Headquarters at Ottawa, and was in large measure responsible for interpreting the needs of the 21st Army Group planners to Canadian Headquarters, so that the Canadians could make a maximum contribution without relinquishing control of Canadian services. In this way Canadian general hospitals in England were brought into their operational role as being available for all allied casualties, when necessary, while remaining under Canadian command.

It was considered that adequate hospitalization could be provided by having the number of hospital beds equal to ten per cent of the total

personnel of the Canadian Army Overseas. This meant that the medical corps would operate on the basis of 22,100 hospital beds authorized, and the problem resolved itself into a question of allocating the various hospital units to static and mobile roles; to training them for the specific part which they would be expected to play in the operation; and to mobilizing and transporting sufficient hospitals from Canada to bring the establishment up to authorized strength. By March 1944 there was a total of 10,104 Canadian hospital beds in England in static, special, and convalescent hospitals, and this number could be increased by another 2277 beds by expanding each hospital to its maximum overflow. It was proposed to bring the total number of beds up to the target of 22,100 by using hospital units already mobilized or authorized for mobilization in Canada.

Early in May the plan for making hospitals available for the continental theatre was drafted. It was proposed to move hospitals to the Continent, taking into account their seniority, so that those who had been longest in England should have the first opportunity of operating as field units. Canadian hospitals were to go forward scaled to British war establishment and with British scale of medical equipment. Canadian general hospitals were also asked to provide medical teams for six of the L.S.Ts. which were to evacuate casualties from the beach. The teams were to remain on strength of their parent units, but to be attached for the period of the assault to the L.S.Ts. It was expected that the 35 L.S.Ts. manned by military medical personnel would be withdrawn within the first week or ten days and that the Navy would continue to operate the other half.

The arrangement for handling casualties on arrival in England was that E.M.S. (Emergency Medical Service) would take over the handling of all casualties on reception at the transit hospitals. The position of the Canadian hospitals was not clearly defined at first as the E.M.S. was of the opinion that it was receiving general casualties from the British and Canadian fronts. This was definitely clarified on 3 May 1944 with Mr. Frankau, the British official in charge of the hospitalization scheme for the E.M.S. He had arranged that E.M.S. hospitals at Park Prewett, Epsom, Guildford, and Woking, would act as transit hospitals and receive all the casualties evacuated from the coast. He now added No. 2 Canadian General Hospital at Bramshott, No. 4 Canadian General Hospital at Aldershot, and No. 17 Canadian General Hospital (Pinewood) at Crowthorne to the scheme. Later the E.M.S. hospital at Chichester was also added as a transit hospital.

In order to assist in the clearance of E.M.S. hospitals in the area east of Portsmouth, No. 9 Canadian General Hospital at Horsham, No. 13 Canadian General Hospital at Cuckfield, and No. 12 Canadian General Hospital at Horley were included for the reception of unorganized casualties* arriving in that area, i.e., they were to act as coastal hospitals. In preparation for the expected casualties these hospitals were relieved of the care of casual sick

* Unorganized casualties were those arriving in non-medical vessels.

who were evacuated to No. 11 Canadian General Hospital at Taplow, No. 20 Canadian General Hospital at Leavesden, Roman Way Convalescent Hospital at Colchester, and No. 4 Convalescent Depot at Hunmanby. As a result of this policy Nos. 2, 4, 17, 9, 12, 13, and Basingstoke Neurological and Plastic Surgery Hospitals, were practically empty by D Day.

Steps were taken to provide Canadian general hospitals which would act as base hospitals, for emergency expansion. Although there was a shortage of canvas, some tents were supplied to No. 18 at Cherry Tree, No. 20 at Leavesden, and No. 11 at Taplow, and provision was made for additional ambulance drivers, ambulances, and stretcher bearers. Any casualties arriving from the Mediterranean theatre were to go to No. 19 at Marston Green, and minor injuries to Canadian personnel in England were to be handled by No. 1 Special Hospital at Alton. In order to handle any casualties among those who had already been briefed for the operation No. 18 at Cherry Tree became a security hospital from the end of May, and just prior to D Day it was joined in this role by No. 13 at Cuckfield.

As a result of the inclusion of so many Canadian hospital units as coastal, transit, and security hospitals, it was decided not to attempt to separate Canadian casualties from the general evacuation streams except in sufficient numbers to fill the 600 available beds in Nos. 11 and 20 Canadian General Hospitals.

The medical components of the Canadian assault force were three field ambulances, one light field ambulance, two field dressing stations, and a field hygiene section. Only the three field ambulances were to participate in the initial assault; apart from these the Canadians were to be dependent upon British medical units. It was planned that two assault sections of the field ambulances should touch down 20 minutes after the infantry battalions which they supported, while a third section should come in a few minutes later with the supporting battalion. Reserve sections were to land later in the day and set up advanced dressing stations further inland. As units of the 2nd Canadian Armoured Brigade were to be employed in support of the infantry brigades of the 3rd Canadian Division, the light field ambulance was not to participate in the initial assault. All medical arrangements ashore were to be under the control of the A.D.M.S., 3rd Canadian Division, until British Corps Headquarters landed and assumed administrative control.

TRAINING FOR THE SECOND FRONT

Canadian units had received training in the course of their duties, in special lectures and through actual experience for some observers in the North African and Sicilian campaigns, but further training was considered necessary.

Training of hospitals was discussed with the British medical staff of 21st Army Group which had decided that the British hospitals would undertake no special training beyond breaking their equipment into 50 bed packs.

The Canadians decided that specialized training should be undertaken by their hospitals. In anticipation of the necessity for operating under canvas, an N.C.O. and nine other ranks from each of six Canadian general hospitals began a two weeks course of Boyce Barracks, near Aldershot, where they were instructed in the handling of canvas and sanitary arrangements. Other selected personnel were attached to a British ordnance depot to learn how to break down hospital equipment into smaller blocks for ease in handling.

The practice of allowing units with long overseas service to form mobile field hospitals was followed. As a first step toward implementing a programme of having Canadian general hospitals undertake field training before proceeding overseas, approval was obtained to have No. 7 which was operating the static establishment at Taplow, replaced by No. 11. Three more general hospitals were placed on a field establishment basis on 4 May 1944: No. 8 at Aldershot, No. 10 at Leavesden, and No. 16 at Marston Green.

By 1 May No. 7 Canadian General Hospital had turned its patients over to No. 11 and had moved to Yorkshire for training. On 15 May the unit received a set of canvas and began erection of its practice hospital. By 2 June the whole unit was under canvas, officers and nursing sisters were issued with camp kit, and for five days the unit lived in field conditions. In the meantime route marches, lectures, and preparations for field operations were continued, and a further 26 other ranks were sent on an ordnance course. On 7 June the tented hospital was taken down and the unit moved back into Nissen huts. Practice in packing and moving equipment was carried on until 17 June when the unit moved to the marshalling area in Eastbourne. A similar training programme was carried out by Nos. 8, 10, and 16 Canadian General Hospitals.

On 11 May the personnel selected to assist in manning the L.S.Ts. were sent to Hyde in the isle of Wight where they were shown how to load casualties on DUKWs and transfer them to L.S.Ts. After a week of practice in loading and unloading casualties they could unload a DUKW in one and a half minutes. On completion of the course the men were returned to their units prepared to do their jobs when the invasion of Normandy began.

During the latter part of 1943 field ambulance units of the 3rd Canadian Infantry Division began training with the second front definitely in view. Emphasis was placed on combined operations training for individuals and units during the first part of the course. Beginning with a series of lectures on gas precautions, aircraft recognition, and combined operations, the ambulance units progressed during the winter months to practical training in assault landings with the infantry battalions with which they were to operate. By May 1944 each unit was carefully schooled in its role and had settled down at its final concentration point to spend the last month before the invasion packing and loading its equipment and making final preparations

for its assault role. By 1 June hospitals, medical crews, and ambulance units were all prepared and waiting impatiently for the invasion of Europe to begin.

THE ASSAULT AND LODGEMENT, 6-25 JUNE

Dawn on 6 June found thousands of ships, from large 15 inch-gun battleships to tiny two-man truck landing craft, off the coast of Normandy. The aerial bombardment of the beach positions had begun just before midnight on 5 June. In the half hour preceding the landing daylight bombers took over and the guns of the fleet opened up supported by the army's own guns firing from their landing craft. D Day had come.

A few minutes after eight o'clock the assault battalions of the 7th and 8th Canadian Infantry Brigades touched down on the Normandy beaches; the moment for which they had trained so long and so intensely had arrived. There were four main strong-points on the front of between four and five miles which the Canadians were to assail: on either side of the mouth of the River Seulles at Courseulles-sur-Mer, at Bernieres-sur-Mer, and at St. Aubin-sur-Mer. The enemy gave a good account of himself, and the opposition was stiff.

As it turned out neither the Canadians nor their Allies reached their final objectives on D Day. The time table was slightly behind from the very beginning. Although the 7th Brigade made good progress, it did not get beyond its intermediate objective and concentrated for the night east and south-east of Creully. The 9th Brigade landed near Bernieres about 11 a.m., but as a result of the trouble encountered by the 8th in the inland villages it was late in the afternoon before its advanced guard could pass through. The advanced guard then had to overcome successive enemy machine-gun positions. As a result it halted for the night some four miles north of Caen, with the balance of the Brigade in the rear.

The next morning all three Canadian brigades pushed on again, and the 7th on the right was able to go straight through to the final objectives astride the road and railway between Caen and Bayeux. The 9th on the left received the weight of the 12th S.S. Panzer Division. The villages of Buron and Authie, which had been entered early on 7 June by advanced units, had to be abandoned as our troops fell back to Les Buissons, about three and a half miles from the edge of Caen. Caen, which had been a D Day objective, did not fall into allied hands for more than a month.

THE AMBULANCE UNITS

The assault sections of Nos. 14, 22, and 23 Canadian Field Ambulances were the only Canadian medical units taking part in the initial landings. These units were attached respectively to the 7th, 8th, and 9th Brigades of

the 3rd Division and landed with them. For the first hour or so they remained in the beach area collecting casualties, giving them first aid, and "nesting" them in the shelter of sea walls, buildings, or wherever they could be kept from the withering fire that still swept the beaches. As the assault battalions moved inland the ambulance sections followed close behind, making the wounded comfortable until evacuation was possible.

Events decreed that the field ambulance units which landed on D Day and D plus one were to operate for the first few days without any new divisional orders, as those issued prior to the opening of the assault carried them through to the divisional objectives. Each field ambulance commanding officer maintained close liaison with his respective brigade, and moved within reach of brigade headquarters at all times.

Following its assault sections, No. 22 Canadian Field Ambulance's main party landed about six o'clock on the afternoon of D Day when the battle had moved well inland. While the main party assembled near the beach a site was chosen for an advanced dressing station at Beny-sur-Mer. It was ready to receive casualties by nine o'clock on the morning after D Day. Here the advanced dressing station was joined during the day by members of its assault sections who had landed with the 8th Brigade. This site was under enemy fire for the first 48 hours and four members of the unit were wounded. These men, together with the casualties being received from the 8th and 9th Brigades, were evacuated back to British field dressing stations at Bernieres-sur-Mer. Beny-sur-Mer remained the site of No. 22 Canadian Field Ambulance Headquarters until the attack on Carpiquet (4 July). Casualty collecting posts were set up further inland at Cairon, three miles from Beny-sur-Mer and at Neuf-Mer, a little further on. Fortunately, casualties during this holding period were only about 12 per day of all types of sick and wounded, and the ambulance unit was able to use the period of calm to improve its facilities.

The three assault sections of No. 14 Canadian Field Ambulance landed with their respective assault battalions early on D Day. The remainder of the unit was phased to land three to four hours later, although a reconnaissance team had been put ashore about 11 o'clock to select a suitable spot for an advanced dressing station. The vehicles and personnel from the various craft loads were assembled at Banville, where a dressing station on wheels was set up by the unit. On the following day an advanced dressing station was established in a house at Pierrepont, about four miles from the coast, but for the first few hours it was difficult to clear casualties as the jeep ambulances had not arrived. By 6 o'clock in the evening they had all come in and a scheme of evacuation was begun. Jeeps were sent forward to the battalions and casualties evacuated to the dressing station.

On 8 June a casualty collecting post was set up at Secqueville-en-Bessin to evacuate casualties from the Regina Rifles, who were meeting strong German resistance a couple of miles farther south. Jeep and ambulance

drivers in this section came under mortar and small arms fire but cleared 115 casualties to the advanced dressing station at Pierrepont. By the evening of 11 June fighting in the area had eased and the unit could concentrate on organizing the Pierrepont installation so that it could give the best attention to its patients. An exhaustion centre was set up in a neighbouring house by a section under the supervision of the divisional neuropsychiatrist, and the condition of the advanced dressing station was improved. During its first 25 days of operation in France the unit cleared 977 casualties through its various installations.

The headquarters of the third Canadian field ambulance, No. 23, landed on 7 June and established itself in a quarry just outside Reviers. It was joined by the rest of the unit on the following day. On 9 June evacuation through a British casualty clearing station at Reviers was begun. On 14 June a section of the unit was set up at Fontaine Henri to take care of the casualties in the divisional administrative area, and the headquarters moved to a position near Amblie. Medical officers from the reserve and headquarters companies were loaned to the casualty clearing station at Reviers during the first few days after D Day when casualties were particularly heavy in that area; on 22 June a dental officer was attached to the section at Fontaine Henri. On 26 June the headquarters moved to Beny-sur-Mer.

OTHER MEDICAL UNITS

For the assault the three field ambulances of the 3rd Canadian Infantry Division were reinforced by the medical units of No. 102 British Beach Sub-Area which followed the assault units ashore and established a Beach Maintenance Area. The Beach Sub-Area was composed of a headquarters and two beach groups, one to each brigade. The medical components of each beach group consisted of two field dressing stations, two field surgical units, one field transfusion unit, one surgical team, a detachment of a field sanitation section, Pioneer Company stretcher bearers and a casualty evacuation point (half of a F.D.S.), all British units. Each light section of the field dressing stations set up a beach dressing station. Of the main sections, one combined with the surgical team, two field surgical units and a field transfusion unit to form an advanced surgical centre, the other operated in its normal role as a field dressing station. The beach dressing stations were set up early in the assault stage and, when the beaches were cleared of the enemy, two advanced surgical centres were established about a mile inland, one at Bernieres-sur-Mer, and the other at Graye-sur-Mer. They were in operation and performing surgery before 11 p.m. In four days they had performed about 220 major operations and handled about 1800 casualties; they continued to function until 19 June.

From D plus two it was possible to concentrate the casualty clearing stations and the hospitals which began to arrive at the beachhead into three

principal medical areas, Hermanville, Reviere, and Ryes. By D plus six it was necessary to close down the area at Hermanville to make way for the expansion of a neighbouring ammunition depot, and a new medical site was chosen at La Delivrande. In the latter part of June a fourth area was developed near Bayeux. The field dressing stations within the Corps were situated near the casualty clearing stations and attended to the lightly wounded, exhaustion cases, and sick, leaving the casualty clearing stations free to handle major casualties.

EVACUATION

No casualties were evacuated to England from the beaches during the first day, and all except the most seriously wounded were moved back to the field dressing stations at Bernieres-sur-Mer and Graye-sur-Mer for the night. On the following day, 7 June, evacuation from the beach was not on an organized basis although a few scattered groups were taken off in assault craft to L.S.Ts. (Landing Ship Tanks), and the DUKWs, which were intended to be used to move casualties from the beach to vessels offshore, were used to move them from the beach back to the field dressing stations a mile or so inland. Early on 8 June an L.S.T. was made available and over 300 casualties were evacuated using "DUKWs, ambulance cars and jeeps — all beach dressing stations greatly relieved".* From that time until general hospitals were established in the bridgehead area a constant stream of L.S.Ts. kept the area cleared of casualties, and aside from the period 15 to 19 June, when a gale halted operations, no interruptions were experienced in the flow of casualties from Normandy back to England. The policy of using medically adapted L.S.Ts. and setting aside DUKWs for medical purposes worked extremely satisfactorily. There were misunderstandings and difficulties concerning the arrival of hospital carriers. Eventually it became routine for officers of the casualty evacuation points to meet the carriers in a DUKW and guide them to the proper anchorage.

As planned, medical officers from Nos. 12, 13, 17, and 18 Canadian General Hospitals together with 30 other ranks from each hospital joined their respective L.S.Ts. on 30 May to assist in casualty evacuation from Normandy. Crews from Nos. 2 and 9 Canadian General Hospitals were held as reinforcements. Vessels used to evacuate casualties went to France loaded with personnel and equipment of all kinds but were fitted to carry up to 300 casualties on the return journey. Each medically manned L.S.T. made about five trips, evacuating casualties from the beach dressing stations through casualty evacuation points and landing them in England before loading up for another crossing. Casualties were given treatment on board in an improvised operating room on the lower deck, fed, and cared for so that they would arrive in England in the best possible condition. By 17

* W.D., A.D.M.S., 3 Cdn Inf Div, June 1944.

June the need for army medical crews on casualty evacuating L.S.Ts. had passed, and the personnel returned to their parent units. By 20 June two evacuation sectors were set up in the 21st Army Group area. In the eastern sector evacuation was from advanced dressing stations to the medical centers at La Delivrande and Reviere; and in the western sector from advanced dressing stations to the medical centres at Bayeux and Ryes. On 23 June a British ambulance car company took over the movement of casualties from these centres to casualty evacuation points on the beaches and, in the case of air evacuation, to the airstrips. By 26 July, 38,581 casualties had been evacuated from the 21st Army Group area to the United Kingdom by sea.

Evacuation by air began on 13 June, which was a week earlier than had been anticipated in planning. Air evacuation was more uncertain than sea evacuation because the airfields on which suitable aircraft could arrive constantly changed and there was always uncertainty as to the numbers of aircraft available. As no facilities existed on the airstrip for holding casualties, preparations could not be made for evacuation until the aircraft had landed, and in a congested beachhead it was not always possible to deliver the casualties at the airstrip on time. On 18 June, the whole evacuation scheme was centralized under No. 11 Line of Communication Sub-Area. A medical liaison officer was attached to 83 Group Royal Air Force. Two British general hospitals at Reviere were made the principal collecting centres for casualties to be evacuated by air, and a single airstrip was selected for evacuation purposes. R.A.F. casualty air evacuation units began to arrive at this time and assisted in holding casualties on the airfield until aircraft were available. The holding capacity of these units was not large enough to deal with the numbers to be evacuated, and on several occasions a field dressing station or casualty clearing station was chosen to assist. The number evacuated by air up to 26 July was 7719.

For the first three weeks (to D plus 23) of operations in Normandy total casualties in the British-Canadian sector were approximately 21,016 of whom 2968 were Canadians. Up to 30 June 19,748 had been evacuated to the United Kingdom, most of the Canadians finding their way eventually to Canadian general hospitals. By 28 July a total of 46,300 casualties (including sick) had been evacuated to the United Kingdom by sea and air.

SUPPLIES

There was no shortage of medical stores in the assault period and only minor losses of equipment occurred. The system of supply over the beaches depended on the early delivery of medical beach maintenance blocks, each composed of two blocks weighing 25 cwt. and containing items of medical equipment designed to meet all reasonable demands until advanced depots

medical stores were established. In addition, much medical equipment was pre-loaded on R.A.S.C. transport to augment the medical maintenance blocks.

In the earliest stage of the assault phase each medical unit carried sufficient medical supplies to maintain itself until the supply system was functioning. Whole blood was kept aboard a headquarters ship in 50-pound insulated boxes containing ten bottles each, and to meet the expected demands for transfusion fluids in the early days of the operation, special issues of blood were made to the assault forces. Field transfusion units landed with a supply estimated to last two days; transfusion fluids were included in the maintenance blocks; two advanced blood banks were landed on D plus three and allocated to each of the corps fronts; supplies of whole blood were sent from England by naval dispatch launch, and after D plus 16 by air.

As the operation progressed a British casualty clearing station became responsible for the holding and supply of blood to forward units through an attached advanced blood bank. General medical stores were landed in beach blocks at the rate of five tons per day from D plus one. In the early stages these too were distributed by casualty clearing stations. In a later stage of the campaign the two blood banks which had been allocated to the assault corps were put at the disposal of the First Canadian and Second British Armies. These were supplied with blood from No. 1 Blood Transfusion Unit, which landed on D plus 16 and set up at Bayeux. The supply to corps and divisional medical units was maintained by a daily service of trucks carrying blood from the army advance blood bank. Penicillin was also distributed through the agency of the Blood Transfusion Service. Up to 26 July the following quantities of blood, plasma, and penicillin were used:

| | | |
|-----------------|--------|------------|
| Blood..... | 18,000 | pints |
| Plasma..... | 15,000 | pints |
| Penicillin..... | 2,400 | mega units |

In the assault the infantry divisions each brought 750 stretchers and 2250 blankets in addition to their own scale of issue. A schedule of landings of stretchers and blankets was arranged so that 11,770 stretchers and 35,620 blankets would be available by 18 June. Ambulance cars were scheduled to land so that the Canadians would have 48 available on D Day and a reserve thereafter.

Water sufficient for the first few days was carried in water bottles, jerricans, and other water containers. No poisoning of water was discovered, and a close watch on supply points by the field hygiene units prevented excessive pollution of the water. Bathing and laundry facilities, while not extensive, were adequate. Fortunately the incidence of communicable diseases, including venereal diseases, scabies, and pediculosis, was exceedingly low during the first month, and sanitation assistants kept watch on the disposal of all refuse likely to attract flies.

The bridgehead area was filling rapidly with fighting and supporting formations, supply routes had been organized, and the problem of caring for the wounded, once so difficult, had now been organized on a sound and efficient basis. Storms had held up the unloading of equipment for four days in the early period, but at no time among Canadian medical units was there any shortage of essential medical equipment.

THE RECEPTION OF CASUALTIES IN ENGLAND

In preparation for the expected influx of casualties from Normandy, Canadian general hospitals in England not earmarked for duty on the Continent were designated for the purpose of the evacuation of casualties as coastal, transit, and base hospitals. This arrangement was in accordance with the scheme employed by the Emergency Medical Service and the War Office.

Classified as coastal hospitals were No. 9 at Horsham, No. 12 at Horley, and No. 13 at Cuckfield. No. 9 received its first group of casualties on 8 June. There were 76 Army and two Royal Canadian Navy personnel in the group and this hospital continued to receive mainly Canadian personnel during the early days of the invasion. No. 12 received its first casualties on 9 June when six Canadians were brought in from Normandy. On the following day 92 casualties were admitted, and this hospital continued to receive groups of 20 to 50 until it abandoned its static role on 1 July and moved to Whitby, Yorkshire, for field training. No. 13 at Cuckfield appears to have been selected at some point in the stream of evacuation as a centre for wounded prisoners of war. It received its first group of Casualties, all prisoners of war on 21 June. By 20 July 343 prisoners of war were admitted, although many had been passed on to prisoner-of-war hospitals under British control. On this date the hospital had 583 beds occupied, 207 by prisoners of war.

Designated as railway transit hospitals were No. 2 at Bramshott, No. 4 at Aldershot, and No. 17 at Crowthorne; No. 22 took over from No. 2 on 1 July. No. 2 received 238 casualties by ambulance train by 8 June and a further 120 on the following day. In its role as a transit hospital it received its casualties in larger groups and was able to make better provision for evacuation than the coastal hospitals, which received casualties by road and had to depend on road transportation and occasional trains to take care of evacuation to base hospitals. No. 4 in its transit role at Aldershot received its first casualties on 8 June. Only three of the 275 casualties admitted on that day were Canadian. No. 17 received its first group of casualties on 9 June, a total of 213 of which only 10 were Canadian. On the following day a further 301 arrived. During the assault phase the number of casualties was less than expected, and those received by Canadian transit hospitals did not crowd their wards excessively. No. 17 Canadian General Hospital reported on 16 June that "not more than 20 per cent of casualties received had been

Canadian", and for the month of June this hospital received a total of 2191 casualties. As a result of the small number coming in, the hospital received word on 23 June to retain all Canadian casualties. This procedure was continued during the month of July, when 3760 casualties were received including 608 Canadians. On 31 July the hospital ceased to function as a railway transit hospital and began to receive casualties brought from France by air. Nos. 4 and 22 Canadian General Hospitals continued to function as railway transit hospitals.

The number of casualties arriving from Normandy was not so great as estimated, and the coastal and transit hospitals were able to handle the greater proportion of these. Consequently, the hospitals designated "base" in the scheme of evacuation received fewer casualties than had been expected and their principal function continued to be the hospitalization of the troops remaining in England.

THE NORMANDY BATTLES, JULY 1944

THE BRIDGEHEAD OFFENSIVE

By 11 June the first phase of Operation "Overlord" was at an end. All three Canadian brigades had rebuffed attacks of German infantry and armour; and although Caen had still to be taken, the bridgehead was secure and troops were being massed for the breakout. Until 4 July troops were being massed for the breakout. Until 4 July the Canadians assisted in the defence of the bridgehead while it was built up. By 15 June half a million men and 77,000 vehicles were ashore in France, and construction of two artificial harbours was well under way; and one month after D Day there were nearly a million allied soldiers in Normandy. By this time it was possible to launch a major offensive. On 3 July the First United States Army developed an offensive southwards on the right flank, pivoting on its left about Caumont and swinging south and east, while British and Canadian divisions held the enemy in the Caen area and continued to build up their bridgehead for a drive along the coast towards the Seine.

The 3rd Canadian Infantry Division resumed its offensive role on 4 July with an attack designed to take Carpiquet village and airfield as a preliminary to the capture of Caen. The 8th Brigade, strengthened by the Royal Winnipeg Rifles, went in with the strong backing of the guns of both the fleet and the army. After a stiff fight Carpiquet village was taken but only part of the aerodrome could be held.

On 8 July the attack on Caen was begun. The 3rd Canadian Infantry Division was on the right of the attack. The 9th Brigade took Buron and Authie, the 7th drove on to Cussy and Ardenne, and the 8th completed the conquest of Carpiquet. On 8-10 July the city of Caen was occupied as far as the Orne.

MEDICAL UNITS DURING THE CONSOLIDATION PERIOD

By 1 July the field ambulance units were well established in France and as a result of their employment in the assault had gained experience which made them capable of dealing with the operational situation as it developed. Close liaison was maintained with brigade and divisional headquarters, and an efficient evacuation system was in operation. Headquarters of Nos. 22 and 23 Canadian Field Ambulances were both in Beny-sur-Mer, three miles from the coast, where No. 22 was operating an advanced dressing station. No. 23 had a section at divisional headquarters at Amblie, three and a half miles west of Beny-sur-Mer, and No. 22 had a section at Cairon, four miles nearer Caen, to act as a casualty collecting post. No. 14 Canadian Field Ambulance

was operating an advanced dressing station at Pierrepont, adjacent to Amblie, and had an exhaustion centre in the same town operated by one section. In addition, it maintained a casualty collecting post at Neuf-Mer operated by three sections.

No. 17 Canadian Light Field Ambulance arrived in France on 13 June and proceeded to a location on the Seulles River near Colombiers-sur-Seulles. On 22 June its headquarters moved to Beny-sur-Mer and two sections were detached to support regiments of the 2nd Canadian Armoured Brigade. A third section was sent to site near Moulin-eaux to serve brigade troops in the headquarters area. The whole unit spent a quiet two weeks, handling only 13 casualties and 13 sick.

MEDICAL UNITS IN THE ADVANCE TOWARDS CAEN 4-9 JULY

In preparation for the 3rd Canadian Infantry Division's attack on Carpiquet, which was planned for 4 July, No. 22 Canadian Field Ambulance established a casualty collecting post at St. Mauvieu, three miles west of Carpiquet, in addition to the one at Cairon. No. 14 Canadian Field Ambulance sent out six heavy ambulances and two jeeps to a point just north of Bretteville l'Orgueilleuse. In the same region No. 17 Canadian Light Field Ambulance set up a casualty collecting post to evacuate casualties from the 10th Armoured Regiment (Fort Garry Horse).

The attack on Carpiquet village and aerodrome began on 4 July against strong enemy positions. Casualties, particularly among the North Shore Regiment and the Royal Winnipeg Rifles, were heavy and were evacuated through Neuf-Mer and St. Mauvieu. No. 14 Canadian Field Ambulance, which ran short of ambulance cars, was assisted during the day by two sections from No. 22. Between them they evacuated 343 casualties to British casualty clearing stations near Secqueville-en-Bessin. By the following evening the enemy defence had weakened, and Carpiquet village and part of the aerodrome were occupied by the North Shore Regiment, le Rgiment de la Chaudi re, and the Queen's Own Rifles of Canada. The number of casualties decreased sharply as these units held their ground, and preparations were made for the offensive against the city of Caen.

In preparation for the attack on Caen, which was to be launched on 8 July, No. 23 Canadian Field Ambulance established a car post of two sections at Les Buissons, about four miles north-west of Caen, to clear casualties of the 9th Canadian Brigade; No. 22 maintained its casualty collecting post at St. Mauvieu to evacuate casualties from the 8th Brigade; and No. 14 set up a casualty collecting post at Cairon and maintained its post at Neuf-Mer to evacuate casualties from the 7th Brigade and attached troops. No. 17 Canadian Light Field Ambulance established a casualty collecting post near Rots to evacuate casualties of the 2nd Canadian

Armoured Brigade and other armoured troops. As the battle progressed they moved forward with the armoured units, evacuating to Pierrepont or Beny-sur-Mer.

In addition to the ambulance units the 3rd Division had under command 20 ambulance cars, of which 12 were assigned for duty at the Pierrepont advanced dressing station, and eight at Beny-sur-Mer. From the advanced dressing stations at Beny-sur-Mer and Pierrepont and the British casualty clearing station at Secqueville-en-Bessin casualties were to be cleared to the medical centre at La Delivrande.

The operation got under way at 4:30 in the morning and during the early part of the operation most of the casualties were evacuated along the Buron-Cairon road to Pierrepont. By two o'clock in the afternoon the advanced dressing station there was beginning to feel the strain of having handled over 220 cases, and No. 23 Canadian Field Ambulance's advanced dressing station at Beny-sur-Mer took over evacuation for four hours. A roundabout evacuation route through Cairon, Thaon, and Basly had to be used, as the more direct route was under the shell fire that had prevented No. 23 Canadian Field Ambulance casualty collecting post at Les Buissons from going forward to Buron to pick up casualties of the 9th Brigade. Towards evening casualties on the 7th Brigade front around Ardenne became heavier, with numerous mortar-shell wounds, and the medical units worked through the night of 8-9 July handling 744 casualties including 684 Canadians. By the evening of 9 July the whole of Caen north of the Orne was in allied hands, although mopping up operations went on for another day or so and casualties continued to flow into the divisional medical units: 308 Canadians and 48 others (including 36 prisoners of war) on 9 July, and 110 Canadians and two others on 10 July.

As the advance into Caen progressed and enemy gun positions were successively overrun, it became possible to move the medical installations closer to the scene of battle. The advanced dressing station of No. 22 Canadian Field Ambulance moved up from Beny-sur-Mer to near La Villeneuve during the afternoon of 9 July, and the advanced dressing station of No. 14 moved from Pierrepont to Cairon. Casualty evacuation was then divided, 8th Brigade casualties to Secqueville-en-Bessin, all others through advanced dressing stations to La Delivrande. The next few days were spent in reorganizing the administration of the bridgehead area and making preparations for a breakout.

THE 2nd CANADIAN CORPS ENTERS THE BRIDGEHEAD

By 10 July the 2nd Canadian Division had arrived in France, and on the following day the 2nd Canadian Corps composed of the 2nd and 3rd Canadian Infantry Divisions and the 2nd Canadian Armoured Brigade, took over the Caen sector. The city had been occupied, and the new offensive planned for

18 July was designed to enlarge the bridgehead area and open the area south and east of Caen for the drive towards the Seine. The 2nd Canadian Corps took part in the offensive as part of the Second British Army. The task of the Canadians was to advance across the Orne from Caen and seize the heights west of the Caen-Falaise road, Fighting was bitter, and by 22 July the enemy had been driven back only about four miles south and east of Caen.

MEDICAL ARRANGEMENTS, 18-26 JULY

With the formation of the 2nd Canadian Corps in France, the medical services were greatly increased. For the coming attack it was decided to constitute a massed medical centre at the Secqueville-en-Bessin area. Here Nos. 2 and 3 Canadian Casualty Clearing Stations, together with field transfusion and field surgical units and No. 9 Canadian Field Dressing Station (Corps), were concentrated. In addition, No. 6 Canadian Casualty Clearing Station was located at Cazelle, under command of 2nd Canadian Corps, with No. 10 Canadian Field Dressing Station sited alongside. No. 6 Canadian Field Dressing Station was located at Thaon, and had attached to it No. 1 Canadian Venereal Diseases Treatment Unit and No. 1 Canadian Exhaustion Unit. This location became the Corps exhaustion centre.

The 2nd Canadian Division had been accompanied by six medical units: Nos. 10, 11, and 18 Canadian Field Ambulances, Nos. 4 and 21 Canadian Field Dressing Stations, and No. 13 Canadian Field Hygiene Section. Moreover, those medical units of the 3rd Division which, it will be recalled, had been held in reserve during the early days of the invasion (Nos. 5 and 7 Field Dressing Stations and No. 7 Field Hygiene Section) had by this time arrived in France.

Field ambulance units of the two Canadian infantry divisions supported their respective brigades, Nos. 11, 18, and 10 with the 4th, 5th, and 6th Brigades, and Nos. 14, 22, and 23 with the 7th, 8th, and 9th Brigades. DUKWs were used to return casualties across the Orne and the Caen canal. Evacuation was from No. 18 Canadian Field Ambulance advanced dressing station at Caen back to the medical group at Secqueville for the 2nd Division, and from No. 23 Canadian Field Ambulance advanced dressing station at Couvre Chef for the 3rd Division.

Due to the early shelling and mortaring by the enemy and the soft mud of the river banks, the proposed DUKW evacuation route across the Orne and Caen canal could not be used, and the 3rd Division's casualties had to be moved across the bridge at Benouville lower down the Orne and on to the British hospital centre at La Delivrande. By 19 July the engineers had constructed two temporary bridges across the Orne, considerably shortening the evacuation route. On the 3rd Division front casualties were directed to No. 5

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FIRST AID AT THE FRONT

Under enemy fire, a chaplain of the 3rd Canadian Infantry Division assists members of a regimental aid post in the treatment of a casualty, Caen area, 15 July 1944. On the left, Canadian snipers are in action.

Canadian Field Dressing Station at Couvre Chef, thence to Canadian Corps medical centre at Secqueville-en-Bessin, rather than direct to the British hospital centre at La Delivrande.

On the night of 18-19 July No. 18 Field Ambulance evacuated 75 casualties from the 2nd Division south of Caen, on 19 July 160, and on 20 July 341. Nos. 10 and 11 Field Ambulances had few casualties to handle during this phase, No. 11 being closed on 19 July to prepare for a move on 20 July, and No. 10 handling local casualties. In the 3rd Division sector No. 23 Field Ambulance handled the greatest number of casualties. It was used as the forward collecting post and, in conjunction with No. 5 Field Dressing Station, as the advanced dressing station to receive casualties evacuated by both Nos. 14 and 22 Field Ambulance casualty collecting posts in the city. In the six-day period, 16-22 July, the advanced dressing station of No. 23 Canadian Field Ambulance handled 338 casualties, almost all those evacuated from the 3rd Canadian Division area.

Canadian casualties had been heavy during the engagement. During the next few days the 2nd Canadian Corps was to have little rest as it held the enemy at bay while preparations were made and troops regrouped for Operation "Spring".

OPERATION "SPRING"

Operation "Spring", which was designed to take the high ground on either side of the Falaise road south of Caen, was planned for 25 July. The operation was to be carried out by the 2nd Canadian Corps, still as part of Second British Army, with the 2nd and 3rd Canadian Infantry Divisions and the 7th and Guards Armoured Divisions under command.

Medical plans for the operation were based on evacuation from forward medical units to the newly established Canadian medical centre at St. Germain la Blanche Herbe, which had now moved forward from Secqueville-en-Bessin. Nos. 14 and 22 Canadian Field Ambulances set up advanced dressing stations in the 2nd Canadian Division sector at Fleury-sur-Orne and Caen respectively, with casualty collecting posts in Ifs.

From the beginning of the operation Canadian units ran into stiff opposition, and the number of casualties from enemy shelling and bombing of troops behind the line of advance was high. Nos. 14 and 22 Canadian Field Ambulances' advanced dressing stations were bombed on three consecutive nights beginning on the evening of 25 July and had 14 casualties among their own men; the number of wounded passing through the collecting posts on the 3rd Division front was not as high as it had been on other occasions. No. 22 evacuated only 71 casualties in the two-day period, 25-26 July.

On the 2nd Division front the situation was more serious. Fighting along the Verrires ridge was fierce, and the Canadian troops were brought

to a standstill by determined enemy opposition. No. 10 Canadian Field Ambulance and No. 21 Canadian Field Dressing Station were set up in caves at Fleury-sur-Orne and so were comparatively free from bombing and shelling. No. 11 Canadian Field Ambulance in Caen, the roadhead for No. 2 Canadian Motor Ambulance Convoy, was held in reserve; No. 18 Canadian Field Ambulance on wheels in Caen was prepared to take surplus cases. During the fighting on 25 July the advanced dressing station of No. 10 cleared over 400 casualties in 24 hours. At the same time No. 11 handled 250. On the following day the two units cleared 285. Although these numbers taxed the ambulance resources every casualty was picked up and evacuated without apparent delay.

Evacuation from the advanced dressing station was carried out through the motor ambulance convoy at Caen to the medical centre at St. Germain. On 27 July this route was shortened by a bridge across the Orne near Fleury-sur-Orne. Some indication of the amount of work done may be gained from the fact that on 26 July the medical centre handled nearly 1000 casualties.

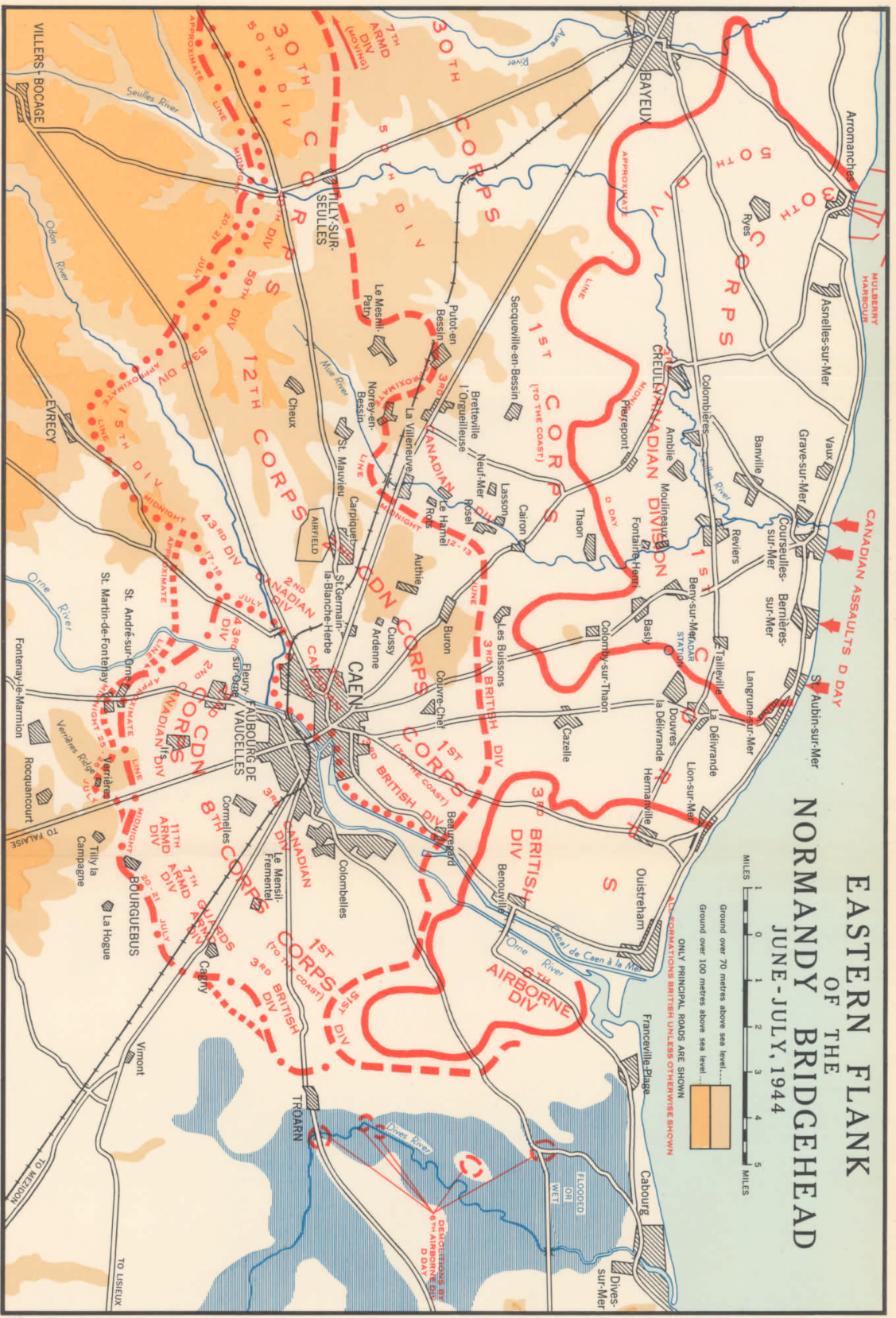
Gains from the operation were not large. In the meantime, the American thrust in the St. Lo sector had begun, and by 30 July the spearhead of the American advance was at the head of the Gulf of St. Malo. Canadian troops had contributed their share to this operation by holding large forces of the enemy south of Caen.

The 3rd Canadian Infantry Division had been fighting almost continuously since 6 June, a period of seven weeks. On 26 July the A.D.M.S. pointed out to Major-General Keller, the G.O.C., and to Brigadier Farmer, the D.D.M.S., 2nd Canadian Corps, that the forward troops were suffering from lack of rest which was greatly impairing their efficiency as fighting soldiers. As a result the division, including ambulance units, was relieved on the night of 30-31 July by the 4th Canadian Armoured Division.

In the early phase of the campaign, battle exhaustion casualties were comparatively few and were held for as much as 48 hours in a small rest camp operated by No. 23 Canadian Field Ambulance. By 21 July arrangements were made for No. 7 Canadian Field Dressing Station at Beauregard Chateau to handle the 3rd Division's exhaustion cases; those of the 2nd Canadian Division were handled by the Corps exhaustion centre at Thion.

HOSPITAL MOVEMENTS

The movement of Canadian hospital units to the Continent had been delayed almost a month as a result of crowding in the bridgehead area, but as this area expanded three Canadian general hospitals, Nos. 7, 8, and 10, with a total bed capacity of 2400, arrived in Normandy and set up in the British hospital area at Bayeux. By 26 July these hospitals were in operation. No. 6, a 200-bed unit under command of First Canadian Army, was set up at Douvres-la-Divrande on the last day of the month. Even with these hospital



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facilities, the policy of evacuating all casualties not likely to be fit for duty within seven days was continued. Thus, the role of the Canadian hospitals in Normandy initially consisted of giving preliminary treatment and holding casualties for evacuation either by air from Reviere or by sea from Vaux.

Meanwhile, in the United Kingdom the role of Nos. 16, 20, and 21 Canadian General Hospitals, which were awaiting transfer to the Continent, was the subject of some discussion. It was felt that they should be prepared to receive casualties from the Continent should the static hospitals be unable to cope with all of them. But it was pointed out that as of 18 July Canadian static hospitals in the United Kingdom had 5000 empty beds and that if all the British casualties in these hospitals could be moved out the number of beds available would be greatly increased. Arrangements were made with the War Office to provide emergency hospital accommodation for the three hospitals should it be necessary. By 12 August operations in Europe had gone so well that the Deputy Quartermaster General, Canadian Military Headquarters, was able to advise: "it is deemed that the emergency provided for will not now arise." The matter was then dropped.

THE BREAKOUT AND PURSUIT 1 AUGUST TO 2 SEPTEMBER

THE TASK OF FIRST CANADIAN ARMY

Since 18 June General Crerar had been in France with his small tactical headquarters, but it was not until after operation "Atlantic" that the bridgehead afforded elbowroom for the deployment of the First Canadian Army. On 23 July, with the 1st British Corps under command, it became responsible for a front of roughly a dozen miles running inward from the coast — the extreme left sector of the allied line. On the last day of the month the 2nd Canadian Corps was added to Crerar's command, and the front of the First Canadian Army was extended to include the area from the banks of the Orne four miles south of Caen to the channel coast east of the mouth of that river. The Canadian Army Commander had under his command for the first time virtually the whole of the Canadian field army apart from the formations in Italy.

The last two operations ("Atlantic" and "Spring") in which the 2nd Canadian Corps had taken part in the area south of Caen had made it apparent that while they might prevent the enemy from sending reinforcements from the area to his troops farther west, it was going to take a much heavier blow to make the kind of break in the German line which would permit a rapid advance toward the Seine. On 4 August General Montgomery ordered the First Canadian Army to put in an attack from Caen in the direction of Falaise. This movement was designed to bring the Canadians behind the enemy forces which were facing the British Second Army on the right of the Canadians. Two days later the Germans began to move forces across to the western end of the Normandy front where the Americans were attacking through the Avranches bottleneck. If the Germans could succeed in pushing through to Avranches they would stand a good chance of cutting off all the American forces which had passed beyond that point; if not, they were in danger of being surrounded.

The Canadian role in the general plan was therefore of supreme importance. Driving down to meet the American break-through force of General Bradley, the Canadians had not merely to hold the German forces between Caen and Falaise to prevent their use against the Americans, but by making contact with the American force they had to cut off the great German force that Hitler counted upon to turn the tide of battle. Once this force had been taken out of action a withdrawal of the remaining enemy forces would be almost sure to follow and these units had to be harried continuously to prevent them making a stand between the Orne and the Seine.

During the preparation for the assault the 2nd Canadian Corps continued to make local attacks south and west of the Falaise road. On 1 August an attack on Tilly-la-Campagne was put in by the Calgary Highlanders of the 2nd Division but was not successful. Casualties were heavy and were evacuated by No. 18 Canadian Field Ambulance from a collecting post at Ifs. During the day 150 casualties were brought back to the advanced dressing station of No. 11 Canadian Field Ambulance in Caen and from there to the medical group at St. Germain la Blanche Herbe. Tilly was attacked again on 2 August by the Lincoln and Welland Regiment of the 4th Armoured Division, again without success. No. 15 Canadian Field Ambulance, which was in action for the first time, had great difficulty in clearing casualties from the forward area due to the mortar fire.

MEDICAL ORGANIZATION FOR THE BREAKOUT

During the period of these attacks preparations were going forward for a full-scale assault down the Falaise road. Medical installations behind the field ambulance units had been grouped into three medical centres. The D.D.M.S., First Canadian Army, Brigadier C. P. Fenwick, who had been in France since 16 June establishing liaison with the British and studying the medical and tactical situation, had a group of medical units at Douvres-la-Dlivrande, which included No. 6 Canadian General Hospital, and also a casualty clearing station and attached units at Cazelle. The 2nd Canadian Corps had two casualty clearing stations, two field dressing stations and attached units grouped at St. Germain la Blanche Herbe, just outside Caen. In addition to these centres there was an extensive 21st Army Group medical centre at Bayeux, including three Canadian and 16 British general hospitals, a British and a Canadian base depot medical stores, and a Canadian dental stores depot.

This organization, while it was able to handle the casualties so far sustained, was still not large enough to hold patients for more than seven days. The policy of evacuating to England patients who were unlikely to recover in this period was therefore continued, casualties going by sea through the casualty evacuation point at Vaux and by air from Reviere.

During the early part of August excellent progress was made in the provision of air evacuation. Six flights a day were arranged from the Normandy front, each aircraft to hold 20 passengers. Flights were to land at Farnborough and Dunsfold on alternate days. Farnborough was to serve the Canadian hospitals at Bramshott, Connaught, Pinewood, and Basingstoke; Dunsfold those at Horley, Horsham, and Cuckfield, obviating "a long and painful trip by motor ambulance",

In Normandy the general medical arrangements of 1 August were excellent for the type of warfare being waged in the Caen-Falaise area. During the first two weeks in August no major rearrangement of medical

units was necessary. As the campaign developed and the tempo increased, it was necessary to make some readjustments in view of the continually lengthening lines of communication.

MEDICAL SUPPORT FOR "TOTALIZE", 7-11 AUGUST

Operation "Totalize", which was designed to break the enemy's line on the high ground astride the Caen-Falaise road and carry our forces south to Falaise itself, began on 7 August. Initially successful, the Canadians met stiffening German resistance, and by the 11th their advance was halted about 8 miles from Falaise. For the operation, Nos. 11, 10, and 18 Canadian Field Ambulances were placed under command of the 2nd Canadian Armoured Brigade, 5th Canadian Infantry Brigade, and 6th Canadian Infantry Brigade respectively, with sections attached to the battalions of the infantry brigades. No. 10 had a casualty collecting post at Iffs and No. 18 an advanced dressing station at Fleury-sur-Orne. No. 21 Canadian Field Dressing Station acted as a resuscitation centre while No. 4 Canadian Field Dressing Station acted as a divisional exhaustion unit. The advanced dressing station at Fleury-sur-Orne was used as a roadhead for No. 2 Canadian Motor Ambulance Convoy which was to evacuate casualties back to the Corps medical centre at St. Germain la Blanche Herbe. Thence casualties were to be taken to the hospital centre at Bayeux.

Just before midnight of 7 August the Canadian armoured columns began to roll towards Falaise. The first advance was rapid and casualties were relatively light, but during the second phase the operation was not nearly so successful. The day bombers of the United States Eighth Air Force dropped some bombs short of their targets, causing casualties and disorganization to allied units. No. 18 Canadian Field Ambulance's advanced dressing station, the only one officially open, handled 503 battle casualties during the day. No. 10, which was standing by for a move forward, had to open hastily and handled 407 casualties. No. 21 Canadian Field Dressing Station, which was operating the resuscitation centre alongside No. 18 Canadian Field Ambulance, took care of another 30 cases and No. 17 Canadian Light Field Ambulance 169 walking wounded.

Further back at the casualty clearing stations in the St. Germain la Blanche Herbe medical area casualties began arriving shortly after midnight of 7 August. Nos. 2 and 3 Canadian Casualty Clearing Stations with attached surgical and transfusion units handled casualties alternately. Between 8.00 a.m. and 11.00 a.m. No. 2 admitted 220, while No. 3, which opened at 11.00 a.m., admitted 303 by 3.00 p.m. The diarist of the clearing station later wrote :

At one time 20 ambulance cars were in the yard waiting to unload. Reception and resuscitation were jammed so it was necessary to simply unload them on the ground. 110 were so placed at one time. Fortunately it was a warm, clear, sunny day. Our entire canvas set up could scarcely have accommodated the number of casualties.

At 3.45 p.m. No. 6 Canadian Casualty Clearing Station at Cazelle was hastily ordered to open; it admitted 221 casualties up to 11.00 p.m. Casualties admitted to the Canadian medical installations at St. Germain and Cazelle for the two days 8-9 August totalled 1347.

Of the casualties occurring on 9 August most were from the attack of the 4th Canadian Armoured Brigade on the west side of the Falaise road. The 28th Armoured Regiment (British Columbia Regiment) and the Algonquin Regiment* suffered especially heavy losses, and during the day the Brigade's ambulance unit (No. 12 Light Field Ambulance) evacuated 215 casualties from the engagement.

Medical installations were busy again on 10 August as Canadian units fought to hold their gains against the fresh German troops which had been brought up to stabilize the position. During the night the 2nd Canadian Infantry Division put in an attack halfway down the Falaise road but did not succeed in breaking through the defences. For this attack No. 14 Canadian Field Ambulance had an advanced dressing station at Rocquancourt and was assisted by sections of No. 23. No. 22 had a casualty collecting post at Cintheaux from which 153 casualties were brought back during the day.

By 11 August the Germans stabilized their positions, and the Canadians were held halfway between Caen and Falaise. That evening they received a priority order from General Montgomery to "capture Falaise". The plan to bottle up the German army was beginning to be carried out. For the further advance into Falaise the Canadian units were regrouped while engaged in holding their positions. The attack was to be made by two columns of armour and infantry still moving down the Falaise road and supported by bombing attacks by the Royal Air Force and the Royal Canadian Air Force.

THE ADVANCE RESUMED, 14-16 AUGUST

At noon on 14 August the columns of tanks moved forward and, despite fierce opposition, were well established within three miles of Falaise by nightfall — an advance of about five miles. On 15 August the advance was resumed, though at reduced speed, and by the afternoon of the 16th troops of the 2nd Canadian Infantry Division were in Falaise.

Medical arrangements were on much the same basis as for "Totalize". The 2nd Division had one field ambulance (No. 11) operating an advanced dressing station and two (Nos. 10 and 18) on wheels ready to advance with the attacking force. The 3rd Division had an advanced dressing station operated by No. 14 Canadian Field Ambulance and No. 7 Canadian Field Dressing Station at Rocquancourt. The 4th Canadian Armoured Division had an advanced dressing station operated by No. 15 Canadian Field Ambulance at Gumesnil, with No. 12 Canadian Light Field Ambulance ready to move forward as the battle progressed.

* Two infantry companies of the Algonquin Regiment were attached to the 4th Canadian Armoured Brigade.

Unfortunately the operation was marred by another bombing error on the afternoon of 14 August. This time the Royal Air Force and the Royal Canadian Air Force bombed behind our own lines, causing 200 casualties. Once again the casualty clearing stations in St. Germain were hard pressed as the bombing casualties arrived in a sudden rush about four o'clock. Again No. 3 Canadian Casualty Clearing Station could not find shelter for all the wounded. No. 2 Casualty Clearing Station received 212 casualties in less than one hour but was apparently able to get them all under cover. During the day the two units received 537 casualties. Nos. 9 and 10 Canadian Field Dressing Stations in the same area admitted 569 and were so rushed that it was necessary to open both No. 6 Canadian Casualty Clearing Station and No. 33 British Casualty Clearing Station at Cazelle where a further 694 casualties were taken for treatment.

THE CASUALTY CLEARING STATION PROBLEM

Earlier in the month the D.D.M.S., First Canadian Army, had remarked that "apparently the limiting factor in a casualty clearing station is not bed capacity but surgical capacity". This was again demonstrated on 14 August when the two Canadian casualty clearing stations at St. Germain admitted 241 casualties and evacuated 218 to general hospitals before six p.m., retaining only 122 (including some from previous days) as unfit for immediate evacuation. It was the sudden influx of casualties after four o'clock which taxed the surgical capacity of the clearing stations and delayed treatment.

Most of these clogging the evacuation stream at the casualty clearing stations were of two types, the walking wounded who were the most numerous but who often needed the least medical attention, and the extremely serious cases which were fewer but consumed a great deal of the surgeon's time. It was recognized that as the line of evacuation became longer more cases would likely fall into the latter class and that a long journey would be likely to make resuscitation even more difficult. An attempt was made to relieve the casualty clearing staff by attaching personnel of a field dressing station to assist them during an influx of casualties, but this was thought to be a costly use of the dressing station resources as many of the personnel and most of the equipment were idle. A further attempt was made by using a field dressing station to take all walking wounded, and this was also found inefficient as ambulance cars frequently went to the casualty clearing stations first and then brought back walkers to the field dressing station, thus holding the ambulance cars unnecessarily.

On 14 August the D.D.M.S., First Canadian Army, and the Officer Commanding No. 10 Canadian Field Dressing Station evolved a plan whereby "all ambulance cars that come into the medical area would go first to a field dressing station where a rapid triage could be done: (a) walkers — all get out of ambulance; (b) lying cases apparently lightly wounded and

obviously in good condition admitted to field dressing station; (c) all others to go on to casualty clearing station. Group (a) would then very quickly be divided into: (i) those who could be immediately sent on to hospital; (ii) those who must be admitted to a field dressing station for investigation, for change of dressing, or for conversion to stretcher cases".

On 15 August the D.Ds.M.S., 1st British and 2nd Canadian Corps and First Canadian Army, met at No. 2 Canadian Casualty Clearing Station in St. Germain and evolved a further plan for:

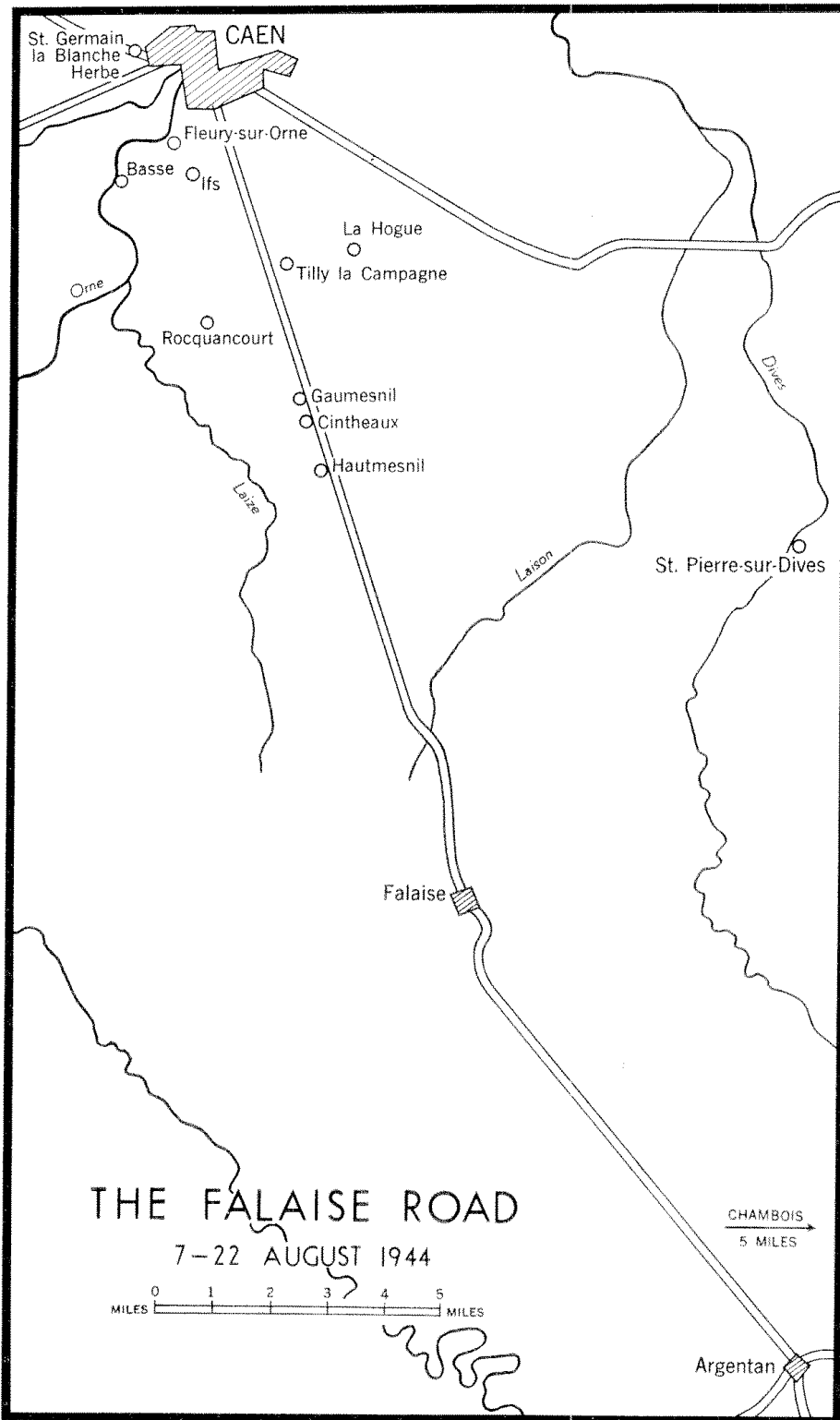
one field dressing station to be attached to each casualty clearing station, the field dressing station to be set up as an integral part of the casualty clearing station, the bulk of the field dressing canvas being used as the admission ward. To this ward all casualties would be admitted and a very rapid triage done as a result of which about 20 per cent of the casualties would need to be transferred to the casualty clearing station admission tent. Here they would be admitted to the casualty clearing station and receive further triage and treatment accordingly. Of the 80 per cent of total casualties who could be handled by a field dressing station approximately one-third would be walking wounded who could be dealt with very quickly and passed to evacuation wards almost immediately. Of the remaining two-thirds most would require only change of dressing, rest, fluids, food, etc., and these too could be dealt with very quickly and transferred to evacuation. A very few would, on closer examination, perhaps have to be transferred to a casualty clearing station for resuscitation or treatment. Such a scheme really involves pooling field dressing station and casualty clearing station completely, both personnel, tentage, and equipment. . . . It is felt that such a scheme would result in using the field dressing stations to their maximum efficiency and at the same time enable the casualty clearing stations to give the most serious casualties the best possible treatment.

On 16 August this system was started on an experimental basis with No. 2 Canadian Casualty Clearing Station and No. 9 Canadian Field Dressing Station. "it was at once apparent that this system of letting the field dressing station do the triage was the ideal setup. Officers of both units were very happy. Working in this manner means that the casualty clearing station can remain open much longer than before".

THE FALAISE GAY CLOSED, 17-22 AUGUST

On 17 August the devastating blows against the Germans trapped in the Falaise pocket were begun. These troops, attempting to cut across the American lines of communication by driving west toward the First United States Army, had been virtually cut off by 17 August and for the next week were cut to pieces, although fighting desperately to break out and inflicting heavy losses on the Canadians who held the stopper in the bottle.

By the evening of 19 August the gap was closed when the 1st Polish Armoured Division of the First Canadian Army joined elements of the 90th United States Infantry Division near Chambois — but fighting along the escape route had been violent and was so for the next few days. Many hundreds of Germans fought their way out of the trap in small groups inflicting



heavy casualties in their desperation. During the confused fighting of 19-22 August the 4th Canadian and 1st Polish Armoured Divisions were placed in the path of the German retreat and sustained many casualties while inflicting many on the retreating enemy.

Medical units of the 4th Canadian Armoured Division were kept busy trying to get casualties back, and even enemy vehicles were pressed into service. On 19 August No. 15 Canadian Field Ambulance had a small convoy of two enemy troop carriers and two ambulances which brought in a German medical officer, ten medical orderlies, and 40 wounded prisoners. These were soon separated out, the casualties being sent on to hospital, the others to the prisoner-of-war camps.

THE PURSUIT TO THE SEINE, 23 AUGUST TO 2 SEPTEMBER

The catastrophe which overtook the Germans in the Falaise pocket made resistance between there and the Seine almost impossible and the last week in August saw the Canadians and their Allies pushing forward on the heels of the retreating enemy with everything that would roll. During the last week of August the speed of the enemy's retreat became embarrassing at times, as the drive forward took the allied forces farther from their base area and traffic on the road became increasingly heavy. The enemy, rolling back towards his own home base, had not the same difficulty and was actually able to speed up his retreat as he got farther from the Caen-Falaise area. Fortunately our casualties during this period were comparatively light until contact was made with the enemy rearguard on the Seine itself.

The advance to Falaise and the possibility of further success brought the medical planners the problem of dealing with casualties from an army operating at an increasing distance from its base and along a single thrust line. To meet this situation it was imperative that there should be a casualty clearing station nearer than St. Germain. Thus on 17 August No. 6 Casualty Clearing Station, with Nos. 9 and 10 Field Surgical Units and No. 7 Field Transfusion Unit, was moved from Cazelle to Hautmesnil, about half way between Caen and Falaise. No. 10 Canadian Field Dressing Station joined it to form an advanced surgical centre ready to receive casualties on 18 August. As soon as this group was functioning, the flow of casualties to Nos. 2 and 3 Canadian Casualty Clearing Stations of 2nd Canadian Corps was shut off in order that they might get their post-operative patients evacuated and be ready to move forward.

Canadian casualties were now to be evacuated from the casualty clearing station at Hautmesnil to the Bayeux hospital group, except for those who might find the 40 mile journey too long. These cases were to be dropped at No. 2 Canadian Casualty Clearing Station at St. Germain "until such time as No. 88 British General Hospital opened at Ardennes, near St. Germain la Blanche Herbe, for this purpose".

On 19 August the Air Force announced that it was prepared to return forward casualties by air, and this was kept in mind when locating casualty clearing stations. This would not take care of all cases coming back from the battle zone. On 23 August Brigadier Fenwick, D.D.M.S., First Canadian Army, wrote, "the 53 mile ambulance lift from our most forward casualty clearing station is causing some worry as it is expected that we will be on the Seine by the end of the week". By this time No. 88 British General Hospital had been moved to Ardennes to act as a staging post for casualties who were not travelling well on their way to the Bayeux hospital group, and to relieve Nos. 2 and 3 Canadian Casualty Clearing Stations of this task, and it was hoped that No. 6 Canadian General Hospital would be used in a similar role, "probably in the Lisieux area in the near future". But it was difficult to foresee the rate of advance of the fighting units.

By the morning of 22 August fighting had virtually ceased in the area of the Falaise gap, and the Canadian divisions were in pursuit of a fleeing enemy. Forward medical installations of the 2nd Canadian Division were maintained by placing field ambulances under command of their respective brigades and having the ambulance of the leading brigade establish collecting posts and dressing stations along the axis of advance. One of these posts was to act as roadhead for the motor ambulance convoy and remain open until all brigades had passed it. Its role was then to be taken over by a section of the then leading ambulance unit and the process repeated. Later this policy was modified and a divisional field dressing station (No. 4), took over the role of advanced dressing station for the division.

The 3rd Canadian Division also placed each field ambulance with its respective brigade, so that adequate casualty clearance could be maintained along the axis of advance even when the brigades were temporarily out of touch with the divisional A.D.M.S. No. 23 Canadian Field Ambulance adopted the method of having one section remain in a known position while two moved forward with the brigade to be joined by the remaining section when the new post was established.

The 4th Canadian Armoured Division, which was on the right during the advance towards the Seine, had its field ambulance sections forward with the advancing column and the headquarters in the centre. The field dressing station was in the rear acting as a dressing station and dispatch point for the motor ambulance convoy carrying casualties back to the Corps medical installatims. "While much concern was felt having no medical installation actually on the ground owing to the fact that little or no firm resistance was expected and that Corps units were pressing forward in the rear, it was necessary to accept risks". In two days the division advanced 100 miles and sustained only moderate casualties, evacuating a total of 109 for a three-day period.

In Corps formations the problem of rapid movement was complicated even more by the size of the units and the lack of transport for those which



The National Gallery of Canada

From a painting by Major W. A. Ogilvie, M.B.E.

The MEDICAL SCENE NEAR PONT DE L'ARCHE, FRANCE

This painting shows the advanced dressing station of No. 15 Field Ambulance operating about five miles east of Elbeuf, August 1944. This site was one of many occupied by the unit during the rapid pursuit of the retreating German armies across northern France.

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were not mobile. On 18 August the new Corps medical area was functioning at Hautmesnil with Nos. 5 and 10 Canadian Field Dressing Stations and No. 6 Canadian Casualty Clearing Station. Two days later No. 6 Canadian Field Dressing Station established an advanced surgical centre at St. Pierre-sur-Dives, 13 miles north-east of Falaise, and passed 500 casualties on to the medical centre at Hautmesnil. On 24 August No. 11 Canadian Field Dressing Station moved forward and became the advanced surgical centre at Le Hamel, ten miles southeast of Lisieux, only to close again three days later, after handling 280 casualties; it was passed by No. 2 Canadian Casualty Clearing Station which opened at Brionne on 27 August. This move allowed Nos. 5, 6, and 11 Field Dressing Stations to close and be prepared for the Seine crossing.

Movement along the crowded roads was difficult and moves were so frequent as to become almost continuous. No sooner had a Corps field dressing station been established in a then existing divisional area than the division was moved into the distance in a matter of hours.

For the pursuit First Canadian Army had the 1st British and the 2nd Canadian Corps under command, but as each Corps had a separate axis of advance it was impossible to pool their medical resources. Each Corps had to move its own medical units in relation to the speed of its advance, while the army medical units attempted to keep up evacuation to the base hospital area. "There were days when another 100 casualties would have broken down the machine. But that extra 100 never occurred".

The problem of movement for medical units was complicated by three factors besides that of congested roadways. Units had to leave small detachments behind to care for casualties which could not be moved, and at one time there were 11 of these groups nested along the route. Units had still to continue admitting casualties while on the move, and to do this a "trickle" system of movement was devised. No. 6 Canadian Field Dressing Station moved several times without closing. On 18 August the unit moved from Basse to Cintheaux while admitting patients. For the first part of the move patients were admitted to the rear position (Basse), then as more of the unit arrived at the new location the flow of casualties was diverted there. Those retained at Basse were either evacuated or brought forward with the rear-party.

A third complication was that of communication. The problem of keeping in touch with forward units in order to control the flow of casualties to particular field dressing or casualty clearing stations had been given attention for some time. Dispatch riders provided the surest method of communication, but in some instances even they had great difficulty, especially during night moves through congested areas. The last week of August was rainy in Normandy and accentuated the problem.

During this week medical units of the 2nd Canadian Division were assigned wireless detachments, under divisional arrangements, consisting of a

corporal and two privates. There was some difficulty at first with the Slidex* code, which resulted in such ambiguous messages as "dispose of diphtheria, dispose of ampoules, dispose of . . .", but it was generally considered "most useful in getting rapid information and saving dispatch rider runs in bad weather and at night. Although not essential it does promote easier control and keeps us more readily in the picture".

On the morning of 26 August 2nd Canadian Corps' leading troops reached the Seine river and took over from the Americans who had pushed down the river as far as Elbeuf. By 28 August lines of evacuation stretched to more than 90 miles, and it was 70 miles from No. 6 Canadian General Hospital, which had opened on that day at St. Hymer, back to the hospital group at Bayeux. It was evident that road transport alone was not adequate to care for the evacuation of casualties of a rapidly advancing army as it often took up to 48 hours for an ambulance convoy to make the round trip back to the base hospital area. Ambulance trains were not available, and so it was fortunate that on 1 September air evacuation from Brionne to Bayeux began. On return trips air ambulances were used to bring forward medical supplies, thereby providing a means of rapid transport for plasma and other perishable and expendable items.

In anticipation of this rapid advance the medical area at St. Germain la Blanche Herbe had been closed on 18 August. No. 3 Casualty Clearing Station moved out to Livarot,† handing over its remaining patients to No. 2 which reverted to army command and was used to hold 116 post-operative cases which could not be moved. No. 88 British General Hospital which had already closed, was on its way to Brionne, half way between Falaise and Rouen, and was soon to undertake again its role of staging casualties on the long road to the base hospital area.

During the last three days of the month the 2nd Canadian Corps fought a tough battle in the Fort de la Londe. The 4th and 6th Brigades, engaged for three days until the German withdrawal across the Seine, suffered heavily in attempting to clear this rugged piece of country. By 1 September the Seine had been crossed and the army was preparing for a further sweep forward.

The last two weeks in August had seen a great advance for the Canadians and great destruction to the German Army. The price was high. First Canadian Army for the month of August had 9369 casualties, of whom 2258 lost their lives.

The Canadian hospital facilities had been increased during August by the arrival of two more Canadian 1200-bed hospitals (Nos. 2 and 12). The Canadians now had 5000 beds in general hospitals in Normandy. Furthermore, No. 2 Canadian Convalescent Depot arrived and was set up alongside the Bayeux groups of hospitals. It operated under canvas from 16 August, encountering all kinds of difficulties with rain, mud, water supplies, and

* Slidex—A simple instrument for encoding messages.

† Nine miles east of St. Pierre-sur-Dives.

equipment shortages. In spite of its heroic efforts, its usefulness was somewhat limited because of the excellent air evacuation to the United Kingdom that existed at this time. Nevertheless, it provided an excellent centre for exhaustion casualties, which had been handled previously by field dressing stations especially assigned this task. During August it admitted 489 convalescents of all types and discharged 13.

FROM THE RIVER SEINE TO THE ALBERT CANAL 3-30 SEPTEMBER

After crossing the Seine the allied advance was more rapid than ever, but every hour of advance lengthened the route over which supplies must be brought, and every vehicle moving forward added to the unbelievable congestion through which medical personnel had to move casualties back.

As the capture of the ports on the English Channel became of supreme importance in supplying the advancing armies, so it also appeared of great value to the medical services in providing a short route for the evacuation of casualties to England. This would relieve road congestion, the acute shortage of the vehicles, and motor fuel needed to keep the medical service functioning at its maximum efficiency over extended routes.

CLEARING THE CHANNEL PORTS, 3-30 SEPTEMBER

The main assignment of the Canadian Army for September was to clear the Channel coast. After this, consideration could be given to removing the enemy from the mouth of the Scheldt. The nature of the task to be undertaken during the month, that of capturing a series of fortified ports and maintaining a drive along the coast behind them, meant that the First Canadian Army was to operate in a somewhat different manner than it had along the Caen-Falaise road.

The United States First Army, which had crossed the Seine near Paris on 25 August, was driving along in the direction of Cambrai and Liege. Between it and the Canadians the Second British Army, which had reached the Somme on 31 August, was advancing through Arras, Tournai, and Brussels. The Canadian Army during September had to maintain its advance on a parallel course and, at the same time, undertake the reduction of some seven channel ports. Dieppe and Le Trport put up little or no resistance; the same was not true of Boulogne, Calais, and Dunkirk. Thus in the battles of September the Canadian divisions were separated, the infantry laying siege to the ports while the armour pressed on farther inland in pursuit of the enemy. By the end of September the assignment for the most part had been completed, and the line separating the Canadian units from the enemy ran from near Zeebrugge on the coast along the Leopold Canal and thence

along the south bank of the Scheldt to within a few miles of Antwerp. From this point it struck off in a northerly direction north of the canal joining Antwerp and Turnhout to a point almost midway between them.

DIVISIONAL MEDICAL SERVICES, 3-30 SEPTEMBER

From D Day to the Seine crossing Canadian fighting formations had been closely grouped due to the restricted area of the bridgehead and the pursuit along a single thrust line. Once the Seine had been crossed the divisions became more widely dispersed, which added to the difficulties of a medical service already operating over extended evacuation routes.

The first week of September found the 2nd Canadian Infantry Division once again in Dieppe, where little enemy resistance had been met. Commemorative services and a ceremonial parade were held and the troops given a short period of rest. Medical units of the division shared in the rest period, maintaining only skeleton services, for casualties were few. On 7 September the Division moved up to Dunkirk as a "containing" force and remained there until 18 September. Then it was relieved and began a further 114 mile trip to Antwerp. By 22 September it had secured a bridgehead over the Albert Canal immediately east of Antwerp, and this was followed by crossings of the Antwerp-Turnhout Canal. Instead of the daily dash forward of 40 or 50 miles units were inching forward along the canal deliberately clearing the enemy from the area. Since there was a steady forward movement of troops, field ambulances were put under command of brigades and advanced dressing stations opened according to the need of the brigade. Both the divisional field dressing stations remained under A.D.M.S. control. Evacuation was to a British medical centre in Antwerp, with less serious cases going back to Canadian installations at Steenvoorde. On 29 September, No. 9 Canadian Field Dressing Station with attached field surgical and transfusion units opened an advanced surgical centre in Antwerp; and 2nd Division casualties were directed to this unit.

The 3rd Canadian Infantry Division had moved up from the Seine during the first week of the month and by 7 September was drawn up in the Boulogne area awaiting the arrival of supporting armour. The fall of Le Havre to the 1st British Corps released the necessary units, and the operation against Boulogne was prepared during the succeeding five days. The attack began on 17 September supported by air attacks and cross-channel firing from the Dover guns.

Field ambulances were positioned to evacuate from their respective forward brigades, each operating casualty collecting posts and an advanced dressing station. These installations, together with No. 7 Canadian Field Dressing Station, were also prepared to evacuate casualties from the artillery and engineer units with the division. On 5 September a German naval hospital at Hardingen was captured, and the following day No. 14 Canadian

Field Ambulance went forward to take it over. It found a well equipped hospital capable of holding 300 or more patients. No. 14 operated here until 2 October, when it moved once again to the field. In the meantime it was joined by No. 5 Canadian Field Dressing Station which, with attached field transfusion and field surgical units, set up an advanced surgical centre, thereby providing an excellent surgical cushion for divisional casualties. From 8 to 22 September this centre received casualties of the 3rd Division, clearing them to No. 6 Canadian General Hospital now located at Wailly-Beaucamp.

During the Boulogne attack No. 22 Canadian Field Ambulance evacuated directly to No. 6 Canadian General Hospital at Wailly-Beaucamp and accepted casualties from the casualty collecting post of No. 23. By 22 September the town was completely in Canadian hands; casualties had been relatively heavy (634), but medical resources of the 3rd Division had been able to handle this number without undue strain.

Three days after the capture of Boulogne the division began to besiege Calais, and for this operation ambulance units were again in support of brigades. Casualty collecting posts of Nos. 14 and 22 Canadian Field Ambulances and No. 17 Canadian Light Field Ambulance cleared casualties to Hardinghen, while No. 23 Canadian Field Ambulance evacuated from its own advanced dressing station to No. 6 Canadian General Hospital at Wailly-Beaucamp. On 25 September a shattering air and artillery bombardment opened the attack of Calais. The Canadians then moved in on the city. On the evening of 28 September the German commander asked for a 48 hour truce to evacuate civilians; he was given 24 hours, and on the 30th the attack went on. After the truce the spirit of resistance of the enemy was lower and by 1 October resistance was at an end. But again the victory had been won at a price, for during the operation medical units of the 3rd Canadian Infantry Division evacuated 687 casualties, although 236 of these were prisoners of war.

The first day of September found the 4th Canadian Armoured Division on the road. By 4 September the whole division was across the Somme preparing to move forward to Bruges. For the move forward field ambulances were attached to brigades, with one or two sections detached to serve main and rear divisional headquarters. No. 12 Canadian Field Dressing Station moved at the rear of the column. During the advance a hospital was taken at Soex, complete with German medical staff. An officer of No. 12 Canadian Light Field Ambulance was left in charge of this group as the column moved forward. Another hospital building at Dixmude was taken over by No. 12 Canadian Field Dressing Station on 8 September, thus relieving to some extent the long evacuation route from the field ambulances back to the advanced surgical centre at Hardinghen.

By 13 September Bruges was in Canadian hands, and on the following day an unsuccessful attempt was made to force a crossing of the Leopold

Canal. Casualties in the Algonquin Regiment were heavy; over 50 cases were cleared. From 16 September to the end of the month no further crossing was attempted though the 4th Armoured continued to patrol the canal, and casualties, including sick, were comparatively light, averaging only 69 daily for the whole division. For this type of operational employment field ambulances remained attached to brigades with sections detached to serve headquarters and administrative areas. Evacuation of casualties was to the advanced surgical centre and No. 3 Canadian Casualty Clearing Station at Lokeren until 25 September, when a Corps advanced surgical centre was opened at Eecloo.

THE CORPS MEDICAL PROBLEMS, SEPTEMBER 1944

During the month of September the 2nd Canadian Corps had at its disposal a field hygiene section, five field dressing stations, four casualty clearing stations, eight field surgical units, five field transfusion units, a venereal disease treatment unit, an exhaustion unit, an advanced depot medical stores, and a special employment company to which post exhaustion cases could be sent for recovery. But the advance of the Canadian divisions after the Seine crossing was so rapid that during the early part of September some of these Corps medical installations were so far behind the line of advance as to be of little use in the treatment of casualties.

No. 3 Canadian Casualty Clearing Station crossed the Seine on 1 September and moved to Wailly-Beaucamp, but did not open until 10 September. No. 2 Canadian Casualty Clearing Station, which was operating near Brionne, closed on 5 September, moved forward to Steenvoorde and opened on 15 September. Two days later No. 3 closed and moved to Lokeren. Thus it was not until 10 September that the first casualty clearing station opened north of the Seine, No. 6 Canadian Casualty Clearing Station being closed 1-13 September during its move to St. Omer. This was partly offset by the use of Corps field dressing stations which with attached field surgical and transfusion units, operated a succession of advanced surgical centres.

Nos. 5, 6, 9, and 11 Field Dressing Stations were thus employed. These units, in a series of moves in the early part of the month, crossed the Seine and followed in the wake of the Canadian forces. No. 6 set up across the Seine at Les Authieux on the first day of the month; but within a short period it moved twice more, to Wailly-Beaucamp on the 5th and to Dixmude on the 11th. No. 5 crossed the Seine on the 3rd and set up at Le Translay, but in four days it was on the move again, this time to Hardinghen. On crossing the river, No. 11 also moved to Le Translay where it remained until the 26th. No. 9 crossed on 7 September and went to Steenvoorde arriving on the 9th, but remaining only eight days when it moved to Lokeren. Even with these long and rapid moves, the medical units were still a considerable distance behind some formations of the Corps and some casualties were cared for in

civilian hospitals in the forward area. With the advance not nearly so rapid after the middle of September, Corps medical units were given a chance to catch up, thereby relieving the situation somewhat.

FIRST CANADIAN ARMY MEDICAL DIFFICULTIES SEPTEMBER 1944

Following the breakout from Normandy, First Canadian Army medical problems were those created by extended lines of evacuation over few and congested routes. The time taken by ambulance convoys greatly increased. Transport, upon which medical units depended for their moves, was now engaged in the vital task of supplying the advancing Army. Added to these difficulties was the problem of a rapidly extending left flank. After the Seine crossing the 1st British Corps turned west to contain Le Havre and the 2nd Canadian Corps turned east, its armour pushing rapidly towards Belgium and its infantry being left to liquidate pockets of resistance along the coast.

In these conditions the evacuation of casualties from Corps installations to general hospitals was extremely difficult. No casualty clearing station was open north of the Seine prior to 10 September so that evacuation was from advanced surgical centres directly to general hospitals. The gap thus left in the evacuation chain threw a tremendous load on ambulance car companies. The employment of advanced surgical centres in the forward area to handle urgent surgery and the movement of general hospitals up to and even across the Seine did much to relieve the situation. On 1 September No. 88 British General Hospital moved up from Ardennes to Brionne where it assisted in holding casualties until they could be evacuated from the nearby airstrip back to the Bayeux group of hospitals. No. 8 Canadian General Hospital was then moved up from Bayeux to St. André-sur-Cailly, north-east of Rouen, and began receiving casualties on 4 September in an attempt to relieve No. 88 British General Hospital for a further move forward. At this time No. 6 Canadian General Hospital was located at St. Hymer. There still were not enough hospital beds available to take care of the casualties of an army which was carrying out a series of intensive operations over a front of more than 200 miles. The critical nature of the problem and its fortuitous solution are well summed up in the quarterly medical report of the First Canadian Army:

On the night of 11 September every available hospital bed was full, every ambulance car on the road, no air evacuation had taken place in the previous 90 hours. It was then a miracle happened. A flight of nine Dakota aircraft dropped in at B 31 airstrip (Fresnoy-Fob) on their way back to England. Squadron Leader Cameron of 84 Group R.A.F. was on the field at the time and convinced the leader of the flight of the necessity for staying overnight until we could collect casualties from the hospitals. His plea was successful and at 0630 hours on the 12th, 195 casualties were lifted to the U.K., and the resumption of airlifts the following day eased a most uncomfortable situation.*

* Quarterly Medical Report, 1st Canadian Army, 1 July - 30 September 1944.

By opening Nos. 6 and 7 Canadian General Hospitals at Wailly-Beaucamp and Martigny on 11 September the holding capacity of army medical installations north of the Seine was increased. But the need for a hospital centre nearer than Bayeux was evident. Rail evacuation was being established at this time but the railhead extended only to M zidon although later (9 September) it was pushed forward to Lisieux. Air evacuation was uncertain due to bad weather. Thus the load on the ambulance car company was very heavy and the steady influx of casualties from the battle area threatened to overflow the forward hospitals at any time.

The last week of September saw the period of violent advance at an end, and the medical situation eased in many ways. Air evacuation continued to Bayeux until 23 September, after which all casualties evacuated by this means were sent directly to England. Nos. 6 and 16 Canadian General Hospitals took all casualties from First Canadian Army front, evacuating either by air to England or by road to Dieppe. Although the hospital centre at Bayeux continued to operate, it received fewer and fewer casualties as hospitals were moved farther forward and air evacuation direct to England became more practicable.

FUTURE MEDICAL PLANS, 21st ARMY GROUP

By 31 August the tactical situation was such that the medical planners of 21st Army Group were able to publish an administrative order outlining the proposed development of medical operations for the balance of the campaign. Its most significant feature was a change of base from the existing one to the Antwerp-Rotterdam area. The plan was divided into five phases. The first considered the situation with the base hospital area near Bayeux, a hospitalization period of 14 days on the Continent and evacuation from Normandy ports and airstrips to the United Kingdom. The second phase was to include the setting up of an advanced hospital area of 600-bed hospitals north of the Seine and the evacuation by air directly to the United Kingdom, or if this was not practicable to the base hospital area, and thence to the United Kingdom, as in phase one. The third phase, which developed during September, included the opening of the port of Dieppe for casualty evacuation and the evacuation of all casualties in the advanced hospital area, through Dieppe, or by air, after the minimum period of hospitalization. During this phase hospitals were to be brought up to the Dieppe area from Bayeux or the United Kingdom. Hospitals from the United Kingdom were to be given the highest priority but the number brought into the area was to be kept to the minimum necessary to meet operational requirements. At this time the intake of the Bayeux hospitals was to be reduced until they were handling only local sick.

The fourth phase, which foresaw the continuation of active operations through the winter months, called for the establishment of a new base

hospital area and a gradual increase in the period of hospitalization on the Continent as new hospitals were opened up. During this phase the number of hospitals in the Bayeux and Dieppe areas was to be reduced to the minimum required for local casualties. The fifth phase, which was planned to take care of the sudden collapse of the German forces, provided for setting up hospitals on an area basis throughout the occupied country.

NORMANDY AND THE PURSUIT A COMPARISON AND CONTRAST

Medical plans during the period prior to the capture of Falaise worked admirably despite the difficulties encountered. Casualties were given every possible attention; rapid collection, early surgery, and speedy evacuation were always provided. Medical units were greatly assisted in their task by the fact that the distance from the front line to the hospital area at Bayeux was never great. Most of the early surgery was done at casualty clearing stations. Field dressing stations were, for the most part, not called upon to form advanced surgical centres but worked in conjunction with casualty clearing stations, doing triage and assisting in evacuation. Transport facilities by land, sea, and air were excellent for the greater part of this period and evacuation did not present a problem. Evacuation by sea to base hospitals in England was under way almost immediately after the campaign began and air evacuation commenced as early as 13 June.

After the Falaise gap had been closed the period of almost static warfare gave way to one of rapid movement. The advance to the Seine, though swift, was not without bitter fighting and the First Canadian Army suffered many casualties. Lines of evacuation had as yet not been extended to impose great difficulties on medical services. After the Seine was crossed, the advance was greatly accelerated and the Canadians swept across France and into Belgium. This new situation severely strained the resources of the medical as well as those of other services, especially during the first two weeks of September.

Medical plans for this phase consisted of evacuation of casualties from Ikkpe to the United Kingdom, rail evacuation to Bayeux, air evacuation either to Bayeux or the United Kingdom, and the establishment of an advanced hospital area north of the Seine pending the establishment of a new hospital base in the Antwerp-Rotterdam area. These plans were essentially sound, but difficulties were immediately encountered. The port of Dieppe was not used for casualty evacuation until 16 September. The railhead, although operating as early as the 6th, extended only to Mezidon. An air evacuation strip north of the Seine which was essential for the direct transport of casualties to England, was prepared by 6 September but did not begin to operate for another five days due to bad flying conditions. Casualty evacuation during this period depended almost entirely on ambulance car companies which, to make matters worse, were forced to haul their own fuel.

As a result there was a serious overcrowding in forward medical installations which was not improved by an influx of prisoners-of-war casualties from captured enemy hospitals. Lack of transport vehicles, which had to be used to bring forward supplies of fuel, food, and ammunition over the now vastly lengthened lines of communication stretching back to Bayeux, and unprecedented congestion on the roads, delayed the establishment of the advanced hospital area north of the Seine.

These difficulties might not have proved so serious had there been sufficient holding capacity farther forward. The same reasons delaying the establishment of hospitals were partly responsible for preventing the movement of casualty clearing stations. There seems to have been some timidity in pushing these units forward when transport was available, and there were delays in opening them when they were vitally needed which the records do not explain.

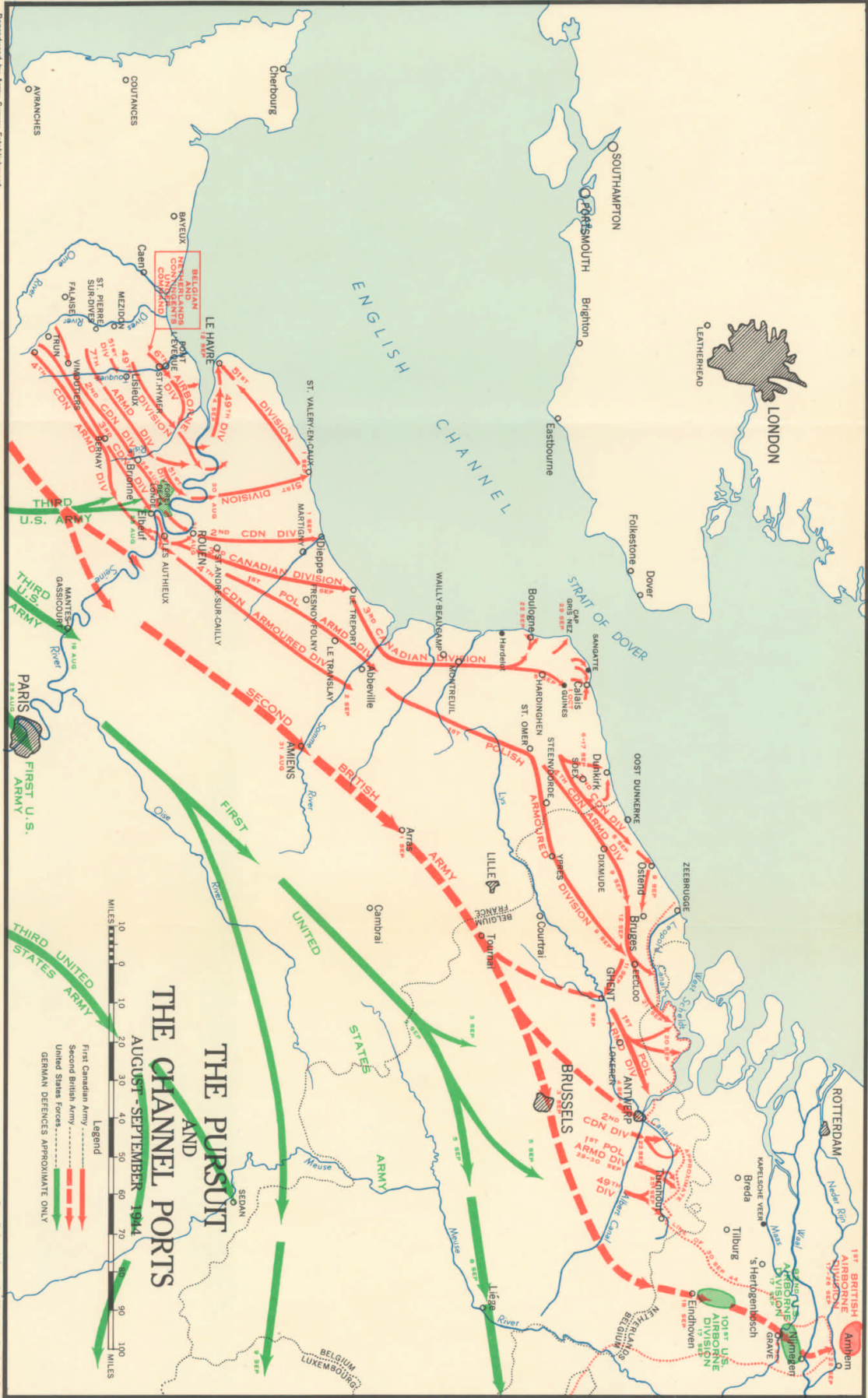
The bulk of forward surgery was ably handled by advanced surgical centres, formed for the most part by corps field dressing stations, but due to the rapidity of the advance even these units were often far behind the fighting troops. Many casualties took as long as 18 to 24 hours to reach a surgical centre. It was reported that not only time but distance travelled affected the mortality rate.* It was suggested at the time that an advanced surgical centre should be located much closer to the actual fighting and that a divisional field dressing station be used for this purpose.†

For the greater part of September divisional medical units evacuated all types of casualties to the nearest advanced surgical centre. This practice was carried over from the period of fighting in Normandy when casualty clearing stations did advanced surgery and the field dressing station did triage. With the field dressing stations operating as advanced surgical centres it was apparent that triage should be done farther forward; failure to do so was resulting in additional and unnecessary burdens for them and occasioning delays in giving surgical treatment to serious cases. When triage was carried out in forward areas it was often possible to evacuate the less seriously wounded by taking them to casualty clearing stations or general hospitals. Toward the end of the month this difficulty was overcome. On 25 September the army's surgical adviser reported that triage forward was much improved and that only the more serious cases were arriving at the advanced surgical centres which he visited.

During the month of September the problems confronting the medical service were enormous. The pursuit of the fleeing German Armies has been described as one of the most spectacular in the history of warfare. Every energy was directed towards maintaining the momentum of the advance, and whole divisions were "grounded" so that their transport could be used to support those leading the pursuit. The fighting units and the services

* W.D., D.D.M.S., HQ. First Canadian Army, September 1944, Appendix 24.

† *Ibid.* Appendix 1, Log of 7 September 1944.



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intimately concerned with the supply of these units had first priority, not only in transport but in roads. In these conditions the medical services' problem of keeping pace with the advance, complicated as it was by a rapidly extending left flank stretching from Dieppe to the Dutch border, a distance of over 200 miles, almost defied solution. Medical units fortunate enough to have their own transport were able, by heroic efforts, to keep pace with the advancing troops. Casualty clearing stations and general hospitals, dependent as they were on borrowed transport, soon found themselves far behind the battle line. Air evacuation, always at the mercy of the weather, rendered vital assistance at a time when other methods of evacuation were being extended almost to the breaking point. Great praise is due the ambulance car companies, confronted as they were by almost insurmountable obstacles. They continued, both by day and by night, to maintain a constant service from forward units to base hospital. Any criticism of the medical service during this period should be weighed against the colossal difficulties that confronted it.

OPENING THE PORT OF ANTWERP, AND THE WINTER ON THE MAAS

By the beginning of October the 2nd Canadian Infantry Division was firmly established on a line running from Merxem in the northern outskirts of Antwerp north easterly along the south bank of the Antwerp-Turnhout canal ; the 3rd Division, having completed the conquest of Calais, had begun concentrating in the area behind the Leopold canal; the 4th Armoured was patrolling the whole south bank of the Scheldt while the 1st Polish Armoured Division, which had assisted in clearing this area, was moved to the right flank.

The plan for freeing the Scheldt estuary envisaged four main tasks. The first was to clear the area north of Antwerp and to close the eastern end of the South Beveland isthmus; this was to be done by the 2nd Canadian Division. The second was to clear the pocket behind the Leopold canal; this was the business of the 3rd Canadian Division and was known as Operation "Switchback". When "Switchback" had been completed, the 2nd Division was to attack along the isthmus to take South Beveland (Operation "Vitality"). The fourth and last phase was to be the capture of Walcheren Island (Operation "infatuate").*

The completion of these operations, fated to be carried on in the most difficult conditions of ground, weather, and enemy resistance, would finally free Antwerp. During the next four weeks the Canadians were initiated into a form of fighting of which they had had no previous experience. A glance at a map of the area in which the Operations were carried out will show that about half the area lies below sea level; the map will not show that it was also heavily defended. Like the allies the German high command recognized the port of Antwerp as one of the keys to the citadel of the Fatherland, and although they were forced by the pressure of the allied pursuit to relinquish the city itself, their prepared fortifications in the Scheldt estuary held out until the early days of November. The Canadians had to advance on each prepared position through country inundated by the fall rains. The enemy fighting to defend these positions in a country in which the only roads were raised above the surrounding fields on exposed causeways had a great advantage over the attackers.

Fortunately the troops assigned to carry out this most difficult operation were by now experienced veterans capable of adapting themselves to the problems which they had to overcome. They had confidence in their leaders and a knowledge that they would be given every assistance by their own supporting services and the naval and air formations with which they worked. By the end of November their confidence was fully justified. Convoys were sailing into Antwerp and although much remained to be done before the

* Stacey, C.P., *Canadian Army*, p. 221.

war was over, the opening of this huge and strategically placed port meant that the "battle of supply", fought by the great convoys of trucks shuttling back and forth from the front lines to the Caen bridgehead, was drawing to a close and that a concentration of materials for the final offensive could be begun.

**THE R.C.A.M.C. IN THE BATTLES OF SOUTH BEVELAND
2 OCTOBER - 2 NOVEMBER**

On 2 October the 2nd Canadian Infantry Division began its movement through Merxem towards the entrance to the South Beveland Isthmus. The three field ambulances (Nos. 10, 11, and 18) were brigaded and each operated an advanced dressing station and a casualty collecting post. No. 21 Canadian Field Dressing Station carried out triage on casualties returned by Nos. 10 and 18 Field Ambulances, evacuating minor sick, injured, and exhaustion cases to No. 4 Field Dressing Station, which was acting as divisional recovery centre, urgent surgical cases to No. 9 Field Dressing Station (advanced surgical centre) and all others to No. 6 Canadian General Hospital; the latter two units were at Antwerp. No. 11 Canadian Field Ambulance evacuated directly to No. 6 Canadian General Hospital. Evacuation from the casualty collecting posts to the field dressing stations was by field ambulance resources, from the field dressing station to general hospital and casualty clearing station by No. 2 Canadian Motor Ambulance Convoy.

During the first week of October, as the Division moved up almost to the entrance of the peninsula, the casualty collecting posts moved forward with their respective brigades. At no time were casualties when wounded more than ten miles from the advanced surgical centre, and when the attack on the heavily defended village of Woensdrecht was made during the second week of the month, No. 4 Canadian Field Dressing Station was moved up to Putte, halfway between Antwerp and Woensdrecht, where it acted as a resuscitation centre and roadhead for the motor ambulance convoy. No. 21 Canadian Field Dressing Station then took over its role as divisional recovery centre. The Division met extremely heavy resistance from well trained German paratroops as it attempted to cross the open, flooded fields lying at the entrance to the Beveland isthmus. On 13 October the Canadian Black Watch lost all its rifle company commanders, and 90 Black Watch casualties were evacuated from the forward casualty collecting post of No. 18 Field Ambulance to No. 4 Field Dressing Station at Putte. Here, besides resuscitation, a type of triage was carried out: cases requiring urgent surgery were passed to the advanced surgical centre operated by No. 9 Canadian Field Dressing Station at Antwerp; minor sick, injured, and exhaustion cases were sent to No. 21 Canadian Field Dressing Station at Ste. Mariaburg, which was operating as a divisional recovery centre; all others were sent on to No. 6 Canadian General Hospital at Antwerp.

By 23 October the 2nd Canadian Division had secured its foothold at the entrance to the South Beveland isthmus and was ready to proceed up the isthmus against South Beveland itself. Field ambulances were as usual to evacuate the casualties of their respective brigades. Casualties from the area of Putte and north of it were to go to No. 4 Canadian Field Dressing Station in Putte, those south of Putte to No. 6 Canadian Casualty Clearing Station in Brasschaet. Both Nos. 4 and 21 Field Dressing Stations were to operate recovery centres, retaining those suffering from minor illness, injury, or exhaustion, and evacuating other casualties to No. 6 Canadian Casualty Clearing Station by cars of No. 2 Canadian Motor Ambulance Convoy.

On 24 October the 4th Canadian Infantry Brigade began the advance along the isthmus. The main and one secondary road had been badly broken up, and the ground off the roads was flooded. Nevertheless, the advance was pushed steadily forward and five days later the division linked up with the 52nd British Division, which had made a landing on the coast behind the Beveland Canal. By the morning of 31 October, South Beveland was captured except for a tiny enemy bridgehead at the east end of the causeway leading to Walcheren. This pocket was soon liquidated by the Royal Regiment of Canada, and the Black Watch then attacked along the causeway itself. By 2 November a bridgehead had been established on Walcheren and held against strong enemy resistance. On the same day the 2nd Canadian handed over to the 52nd British Division and withdrew to Antwerp for a rest.

During the last phase of the battle along the isthmus the advanced dressing stations of the field ambulances were moved forward to shorten the distance from collecting posts to dressing station. No. 10 Canadian Field Ambulance opened a dressing station at Krabbendijke on 28 October and No. 11 opened one at Goes on 31 October. No. 21 Canadian Field Dressing Station was moved at the same time to Kruiningen where it became roadhead for the motor ambulance convoy.

MEDICAL UNITS AND THE LIBERATION OF BELGIUM 6 OCTOBER - 3 NOVEMBER

While the 2nd Canadian Infantry Division was carrying out its operation along the South Beveland isthmus the 3rd Division was setting about the task of reducing the enemy's positions behind the Leopold Canal. The attack was twofold. On 6 October the 7th Brigade crossed the canal after an attack by flame-throwing "Wasps" had shaken the defenders of the far bank. They maintained their precarious bridgehead until an amphibious attack by the 9th Brigade on the enemy's rear provided much-needed support. Then the 8th followed the 9th across the Braakman inlet while the 4th Canadian Armoured Division's 10th Infantry Brigade attacked the land gap west of the Braakman inlet. On 14 October the 8th and 10th Brigades linked up, and on 19 October the Canadians made contact with the brigade of the

52nd (Lowland) Division which had relieved the 3rd Division's 7th Brigade. The liquidation of the rest of the pocket now proceeded and by 3 November all resistance was at an end. The enemy had been cleared from the last corner of Belgium, the first occupied nation in Western Europe to be completely liberated.

For "Switchback" as the operation was called, each infantry brigade had one field ambulance company in support. No. 14 Field Ambulance established a car post south of the Leopold Canal for 7th Brigade casualties, and No. 23 Field Ambulance had one just west of Terneuzen for the 9th Brigade's amphibious assault. From these points casualties were evacuated to the advanced dressing stations established by the two field ambulances. No. 12 Canadian Light Field Ambulance, which took No. 14 Canadian Field Ambulance casualties, carried out triage and evacuated Group I and II casualties to the advanced surgical centre at Eecloo and Group III casualties to No. 12 Canadian General Hospital at St. Andre. No. 23 Field Ambulance evacuated its casualties directly from its own advanced dressing station to No. 2 Casualty Clearing Station at Ghent.

As during the 2nd Division's assault on the Beveland isthmus, stretcher cases had to be carried by hand to the regimental aid posts and from these to the field ambulance casualty collecting posts. From the casualty collecting posts, hand carriage was again employed to take casualties across the Leopold Canal by means of a kapok-bridge and across the Braakman in assault and amphibious craft. Only from the field ambulance car posts and the advanced dressing stations was use made of jeeps and the motor ambulance convoy. For evacuation across the Braakman no amphibious vehicles were allotted for medical purposes exclusively, and it took from two to eight hours to get casualties back, especially at night when travel was both hazardous and irregular.

On 15 October, as the enemy was pushed westward, evacuation of casualties by road around the southern tip of the Braakman commenced. As progress continued No. 14 Field Ambulance moved to Biervliet on the 19th, and to Groede on 30 October, while No. 23 Field Ambulance set up south of Ijzendijke on the 21st. A casualty collecting post from each field ambulance followed in close support of its usual brigade during the remainder of the operation.

By the last day of the month evacuation was possible along the Oostburg-Aardenburg-Maldegem road. Group I and II cases were then evacuated to No. 5 Canadian Field Dressing Station at Eecloo, Group III cases to No. 22 Canadian Field Ambulance at Maldegem and thence to either No. 2 Canadian Casualty Clearing Station at Ghent or No. 12 Canadian General Hospital at St. Andre. Minor illnesses were treated at No. 22 Canadian Field Ambulance, exhaustion cases at No. 7 Canadian Field Dressing Station at Bassevelde. During the period 3-8 November, while the Division was at rest

in Ghent, only skeleton medical services were maintained, and the few casualties sustained continued to be evacuated to No. 2 Canadian Casualty Clearing Station in the town.

In its task of clearing the area between the Leopold Canal and the sea, the 3rd Canadian Infantry Division was assisted by the 4th Canadian Armoured Brigade, which patrolled the south bank of the canal and provide a firm base for the 3rd Division's crossing. An advanced dressing station was maintained on the south bank by No. 12 Canadian Light Field Ambulance until the bridgehead across the canal was large enough for the 3rd Division to set up its own advanced dressing station. This dressing station was maintained until the armoured brigade moved to Antwerp on 10 October. When on 14 October units of the 8th and 10th Brigades linked up across the canal, the need for ferry service across the Braakman ceased, since casualties could be returned by road.

On 17 October No. 15 Canadian Field Ambulance moved out of the Leopold Canal area, following the Algonquin Regiment to Antwerp. Its commitments with the Lincoln and Welland Regiment were assumed by No. 14 Canadian Field Ambulance.

**THE "SUITCASE" OF THE 4th CANADIAN
ARMOURED DIVISION
11 OCTOBER - 4 NOVEMBER**

From 11-18 October units of the 4th Canadian Armoured Division were concentrating in the area east of Antwerp in preparation for Operation "Suitcase". This was to be carried out on the right of the 2nd Canadian Infantry Division and was designed to assist its operation along the Beveland isthmus by relieving the pressure of enemy units on the flank.

From 17 October the 4th Division came under command of the 1st British Corps. It was to advance towards Esschen on two parallel centre lines, a battle group on each. Casualties along the left, or "Green", route followed by the 4th Canadian Armoured Brigade Group were to be cleared by No. 12 Canadian Light Field Ambulance; those on the right, or "Blue", route followed by the 10th Canadian Infantry Brigade Group were to be cleared by No. 15 Canadian Field Ambulance.

No. 12 Canadian Light Field Ambulance set up an advanced dressing station in a Belgian Red Cross building at Cappellen on 19 October. It left one section behind with Rear Headquarters of the 4th Canadian Armoured Brigade and sent two sections forward to form a casualty collecting post which moved forward with the advance. From 20-22 October the advanced dressing station evacuated 49 battle casualties, nine sick, three exhaustion, and eight accident cases. Casualties were evacuated to No. 12 Canadian Field Dressing Station which was operating in connection with No. 6 Canadian Casualty Clearing Station, Brasschaet, as a triage unit and a holding center

for minor sick, wounded, and exhaustion cases; serious cases were passed on to the casualty clearing station. This unit, situated in a large chateau, was in an excellent position to care for casualties along either of the lines of advance.

No. 15 Canadian Field Ambulance, which was clearing "Blue" route casualties, moved up to a point three-quarters of a mile north-east of Brasschaet on 19 October but did not open, casualties being evacuated directly from casualty collecting posts to No. 12 Canadian Field Dressing Station at Brasschaet. As the battle progressed the casualty collecting posts were pushed forward, and the advanced dressing station of the unit was opened in a school building at Achterbroek on 21 October. By 22 October Esschen was firmly in Canadian hands. Casualties on the "Blue" route had been heavier than those on "Green", and during the period of the advance NO. 15 Canadian Field Ambulance evacuated 323 casualties after opening its advanced dressing station on 21 October.

After the fall of Esschen the 4th Canadian Armoured Division turned west towards Bergen op Zoom. In the first phase the 10th Canadian Infantry Brigade Group, together with No. 15 Canadian Field Ambulance, remained in position until relieved by the 49th (West Riding) Infantry Division. The 4th Canadian Armoured Brigade, meanwhile, pressed on to Wouwsche Plantage. No. 12 Canadian Light Field Ambulance then opened an advanced dressing station at Huijbergen, receiving its first casualties on 26 October. During the next four days, fighting was heavy as the Brigade pushed on towards Bergen op Zoom, and by the time it was captured the advanced dressing station at Huijbergen had handled 203 casualties.

No. 15 Canadian Field Ambulance which operated with the 10th Infantry Brigade Group remained in Achterbroek until 29 October although the brigade moved out of Esschen towards Huijbergen the 24th, linking up with the 4th Canadian Armoured Brigade at Bergen four days later. No. 15 closed its advanced dressing station on 26 October although it maintained casualty collecting posts with the 10th Canadian Infantry Brigade. On 29 October it moved forward and established its advanced dressing station two miles south of Bergen op Zoom. No further casualty collecting post was established at this time as casualties were mainly from the mopping-up operations in and around Bergen.

After Bergen op Zoom the next divisional objective was Steenberg. The operation which resulted in its capture on 4 November was carried out in the same manner as the two earlier operations. The 10th Infantry Brigade Group maintained the firm base in Bergen while the 4th Canadian Armoured Brigade pushed on toward the north. The enemy was pushed back to within three miles of the town, whereupon the 10th Canadian Infantry Brigade passed through and effected its capture. Again field ambulances moved with their respective brigade groups, evacuating casualties through the advanced dressing station of No. 15 Canadian Field Ambulance near Bergen op Zoom and No. 12 Canadian Light Field Ambulance now at Heerle to

No. 12 Canadian Field Dressing Station at Bergen and No. 30 (British) Field Dressing Station (advanced surgical centre) at Roosendaal. From these units the less urgent of the 420 casualties sustained by the Division were sent back to No. 6 Canadian Casualty Clearing Station at Brasschaet, while the minor sick remained at the divisional recovery centre operated by No. 12 Canadian Field Dressing Station.

On completion of the operation the 4th Canadian Armoured Division moved to the south bank of the Maas, where it assumed a holding role, relieving the 7th Armoured Division.

BY SEA TO WALCHEREN

Because the 2nd Canadian Armoured Brigade's regiments were used mainly in support of infantry brigades of the 2nd and 3rd Canadian Infantry Divisions, No. 17 Canadian Light Field Ambulance remained in the rear area until 8 October, when it was put under command of the 4th Special Service Brigade for training to support the amphibious operation of the brigade. On 21 October No. 17 was joined by Nos. 8 and 9 Canadian Field Surgical Units and No. 5 Canadian Field Transfusion Unit. The medical establishment for the proposed amphibious operation was completed by the addition of No. 10 Canadian Field Dressing Station.

Training for the operation against Walcheren continued until the end of October when units embarked at Ostend and began to move towards their objective. At three o'clock on the morning of 1 November the flotilla of landing craft sailed out of Ostend harbour. The night was cold and clear and the moon shone down on a calm sea. For some hours they sailed towards England, shepherded along by the escort vessels of the Royal Navy. Then, just before dawn, they met their supporting warships, turned and bore down on Westkapelle. The assault was to be made in daylight on either side of a gap blown in the Westkapelle dyke, and just before "H" hour (9.45 a.m.) the guns of *Warspite*, *Roberts*, and *Erebus* opened up and flights of rocket-firing Typhoon aircraft went to work on the shore batteries.

The Germans had sown sea mines in the approaches to the island; the beaches were laced with barbed wire, landmines, and covered by machine guns firing from cement pill boxes. Five minutes before they were due to touch down the two landing craft which had been prepared as hospital ships were sunk by mines. "Pinpoints of light sparkled from the south batteries. The Germans were opening up at last. The whole line of support craft broke into flame and smoke. Ships blew up and were swallowed in one gulp. Others drifted aimlessly around out of control".* Immediately after this the assault began. One section of No. 17 Canadian Light Field Ambulance landed with No. 41 Commando on the left of Westkapelle gap and another section with No. 48 Commando on the right of Westkapelle gap.

* Lt.-Col. J. B. Hillsman, *Eleven Men and a Scalpel*.

Of the 25 close support naval craft engaged in the operation only six were left by mid-afternoon, and 172 of those on board had been killed and 210 wounded. Casualties among those who got ashore in the face of stiff enemy resistance were heavy. Casualties on the left of the gap were given first aid and collected into a shell hole on the edge of the dyke until West-kapelle was clear, when they were moved into a house in the village. On the other side of the gap the casualty collecting post was set up on the inside of the sea wall, and casualties were held until No. 10 Canadian Field Dressing Station came ashore at 2 p.m. and set up a beach dressing station.

Most of the first day's wounded were taken off during the night by L.C.T. and returned to No. 6 Canadian Field Dressing Station at Ostend. On the following day a casualty collecting post was established at the village of Zoutelande, but no further casualties were evacuated from the island until 6 November due to a storm. The surgical teams which set up in a German hospital dugout were kept busy, and when a villa at Domburg was taken over on 6 November it was used as a surgical centre.

On 6 November a load of walking wounded was evacuated safely to Ostend. On 9 November the remaining German forces on the island capitulated, and on the following day the military casualties were all evacuated from the island. The medical units embarked on 13 November and were returned to their base at St. Michel, near Bruges, by the afternoon.

Casualties sustained in the operation were high. No. 6 Canadian Field Dressing Station at Ostend received 512 (mainly naval personnel) on 1 and 2 November, and a further 220 on the 6th and 7th. No. 6 Canadian Field Dressing Station met the casualties on the dock at Ostend, gave interim treatment, and then evacuated them to No. 108 British General Hospital in the town. The balance of the casualties (57) were taken by road to Antwerp on 9 and 10 November.

Although this amphibious operation was carried out by a British brigade, medical services had been provided by the R.C.A.M.C. The Canadian medical units operated in conditions which taxed their resources to the utmost degree. For the first two days the beaches were still under enemy fire, storms prevented the evacuation of casualties for almost a week, and the violence of the gale made the care of casualties in exposed areas a work in ingenuity as well as one of devotion to duty, for the amount of canvas was barely sufficient to shelter all casualties. Nevertheless, the medical situation was kept well in hand and as the diary of No. 10 Field Dressing Station remarked, "aside from the inconvenience of accommodating the casualties under canvas on a sandy dune in a high wind, they received all the service possible in a field hospital".

**2nd CANADIAN CORPS MEDICAL UNITS
IN THE SCHELDT BATTLES****1 OCTOBER - 3 NOVEMBER**

Medical units under command 2nd Canadian Corps made few moves during the month of October. No. 6 Canadian Field Dressing Station with No. 4 Canadian Field Transfusion, and Nos. 10 and 11 Canadian Field Surgical Units, which formed an advanced surgical centre at Eecloo, remained in position until 25 October receiving casualties from 3rd Canadian Infantry Division's Operation "Switchback". No advanced surgical centre was established across the Leopold Canal; no suitable buildings remained habitable and it would have involved going under canvas on boggy land. When No. 6 Canadian Field Dressing Station was moved to Ostend for Operation "Infatuate" its place was taken by No. 5 Canadian Field Dressing Station, which took over the attached field surgical and transfusion units. From 1 October to 3 November 1944 this advanced surgical centre handled 841 casualties, clearing to No. 2 Canadian Casualty Clearing Station at Ghent or No. 12 Canadian General Hospital at St. Andre.

For the 2nd Canadian Infantry Division's Operation "Vitality" No. 9 Canadian Field Dressing Station, with No. 5 Canadian Field Transfusion Unit and Nos. 8 and 9 Canadian Field Surgical Units attached, formed an advanced surgical centre at Antwerp. Evacuation at first was only 2-3 miles but gradually lengthened as the operation was pushed forward. From this advanced surgical centre casualties were cleared to the Antwerp group of hospitals, Nos. 6 and 8 Canadian and Nos. 9 and 30 British General Hospitals.

On 16 October No. 5 Canadian Field Dressing Station moved up from Lokeren to Hoogboom to form an advanced surgical centre and evacuate 2nd Division casualties to No. 6 Canadian Casualty Clearing Station at Brasschaet. But it found little work there and on 25 October was moved back to Eecloo, where it relieved No. 6 Canadian Field Dressing Station for its task in connection with the operation against Walcheren Island. At Eecloo 3rd Canadian Infantry Division casualties were still coming in, and between 23 October and 3 November No. 5 Canadian Field Dressing Station cleared 331.

No. 6 Canadian Field Dressing Station opened at Ostend to receive casualties from the 4th British Special Service Brigade operation in the Westkapelle area of Walcheren. In addition, it sent a light section with the 52nd British Infantry Division to Flushing. An advanced surgical centre for the latter operation was opened at Biervliet and consisted of a British field dressing station with field surgical and field transfusion units attached. Casualties from the 52nd Division were few and were evacuated to No. 12 Canadian General Hospital at St. Andre, and NO. 2 Canadian Casualty Clearing Station at Ghent.

ARMY AND BASE UNITS

The lack of movement during October as compared with August and September greatly simplified the problem of evacuation within army formations and allowed the larger lines of communication units to be brought again within effective range of the fighting front. At 6 October the following general hospitals were open:

| | | |
|--------------|-----------------|-------------|
| Antwerp Area | No. 9 British | (600 beds) |
| | No. 9 Canadian | (600 beds) |
| | No. 30 British | (600 beds) |
| | No. 6 Canadian | (200 beds) |
| St. Andre | No. 12 Canadian | (1200 beds) |
| St. Omer | No. 16 Canadian | (600 beds) |

Behind the First Canadian Army there were two Canadian general hospitals at Bayeux (Nos. 2 and 10), one at Martigny, (No. 7), one at Mesnieres en Bray, near Dieppe (No. 21).

Air evacuation from Antwerp began on 8 October and casualties were taken directly to the United Kingdom. There were no particular difficulties except that bad weather delayed evacuation about the middle of the month. On 21 October sea evacuation from Ostend began and this second method relieved any anxiety concerning overcrowding hospital installations on the Continent. Casualty clearance was assisted by the opening of the ambulance railhead at Antwerp on 20 October from which the ambulance train cleared through Ghent and Bruges to Ostend, the sea evacuation point.

Although forward army hospitals had at times been crowded almost to capacity, only about 30 per cent of the total beds available in Canadian general hospitals had been used since the invasion. This was due in part to the rapid advance through France and Belgium which made it more practicable to evacuate casualties from the forward zone hospitals. It was also due to an acute shortage of transport to move the large base hospitals* and to the difficulty of finding suitable accommodation for 1200-bed units. At one time the lack of accommodation was so serious that six British general hospitals which had become redundant in the Bayeux area were shipped back to the United Kingdom to wait until suitable buildings were available in the new advanced base area.

It was recognized that it would be impossible to care for sick and wounded in tented accommodation during the winter months. At the same time it was not considered desirable to dislocate civilian life in Holland and Belgium by requisitioning buildings already in use as schools and hospitals. The problem was gradually overcome by taking over buildings which had been used by the Germans as military hospitals and arranging for the use of more school, convent, and hospital buildings to bring up the accommodation to the required scale. In the interval many of those suffering from minor

* Ninety 3-ton vehicles were required to move a 600-bed hospital.

ailments and slight wounds who were evacuated beyond the divisional recovery centres found themselves in the stream of casualties being evacuated to England; they were unlikely to arrive back in the theatre of operations until long after they had recovered. During October the movement of Canadian hospitals from Bayeux to Holland and Belgium began. Casualty admissions in the Bayeux area had dropped rapidly after the Seine crossing and the inauguration of air and sea evacuation to the United Kingdom from the channel ports. No. 2 Canadian General Hospital, a 1200-bed installation, received only 258 patients during October.

By the beginning of November hospital facilities were such that it was possible, especially in view of the reduction in the number of casualties after the clearing of the Scheldt, to increase the holding period in the theatre to 30 days. Those who had recovered within this time were returned to their units through the convalescent depot and reinforcement unit or in some cases directly from the medical unit to the reinforcement unit. At the end of the month eight Canadian general hospitals were north of the Seine: No. 2 at Ghent, Nos. 6 and 8 at Antwerp, Nos. 7 and 10 at Turnhout, No. 12 at St. Andre, No. 16 at St. Omer, and No. 21 at Mesnieres en Bray. Nos. 12 and 21 were used as holding hospitals for casualties being evacuated by air, No. 16 for those going by sea. The latter was also used for troops containing the German garrison at Dunkirk.

COLD WEATHER MEDICAL PROBLEMS

During the month of October there was a noticeable increase in exhaustion and minor illness. The onset of cold, wet weather made it necessary for divisional medical installations to provide covered accommodation in forward areas. In the 2nd Canadian Infantry Division the function of a recovery centre was performed by Nos. 4 and 21 Canadian Field Dressing Stations. In the 3rd Division it was the practice to return exhaustion and minor sick cases to No. 7 Canadian Field Dressing Station, although up to 30 minor sick per day were held at No. 22 Canadian Field Ambulance at Maldegem. In the 4th Canadian Armoured Division the role of exhaustion unit and recovery centre for minor sick was filled by No. 12 Canadian Field Dressing Station at Brasschaet.

October saw fighting formations of the Canadian Army engaged almost continuously in the onerous business of driving back a stubborn enemy across obstacles which were almost as difficult to overcome as the resistance of the defenders. Hand carrying of stretchers was forced upon the ambulance units for almost the first time, and the cold weather and wet ground made it necessary to pick up casualties immediately if the seriously wounded were to have any chance of survival. The weather remained consistently wet with temperatures in the 40-50 F. range, and it was imperative to begin resuscitation well forward. During the second week of October there was

some discussion of the value of having divisional field dressing stations function as advanced surgical centres. However, the area of operations was considerably smaller than it had been in September and was spread fanwise from Antwerp which now contained sufficient hospital accommodation that it was no longer necessary to move the seriously wounded more than a few miles before they received extended medical and surgical attention. The D.D.M.S., First Canadian Army, therefore declined to accept the suggested change and advanced surgical centres remained under Corps control.

During September and October the enemy began to employ V-2 weapons. Their long range and their indiscriminate use made these missiles particularly difficult to deal with, and as they landed on military and nonmilitary targets alike, casualties were often heavy as a result of a single bomb. In order to cope with this new development the 2nd Canadian Division set aside one ambulance car and an orderly at divisional headquarters and had each medical unit within the division earmark an emergency squad to deal with casualties resulting from V-2 action.

The cost of clearing the channel ports and the Scheldt was heavy: 703 officers and 12,170 other ranks were either killed, wounded, or missing. Of these, 355 officers and 6012 other ranks were Canadians. On 3 November Field-Marshal Montgomery wrote to General Simonds: "It has been a fine performance".

THE WATCH ON THE MAAS

On 6 June 1944 the Germans in Normandy had struggled valiantly but in vain to prevent the allies from securing a foothold in North-West Europe. During the long summer days they had tried to stem the drive of the allied forces across France and the Netherlands, and again they had failed. Now winter was drawing on with its cold, short, wet days, and the allies were hammering at the very door of the Fatherland. It must have been apparent in October that, though the Germans might delay, they could not prevent an allied victory. At the same time it was quite apparent to the allied planners that the delay was going to be as great as German arms could make it. Extensive preparations had to be made to deliver a knockout blow at the enemy, and in the meantime any counter thrust had to be parried. The Maas made a fine barrier behind which to prepare, but it had to be patrolled continually while the preparations were carried out. This was the watch on the Maas. From the first week in November until the beginning of the Rhineland offensive on 8 February 1945 the First Canadian Army did not take part in any large-scale fighting. During the first few weeks minor excursions were made to clean up the left bank of the Maas. In December the Ardennes offensive and the expectation of an enemy supporting thrust from the north towards Antwerp brought a reorganization of the force in preparation for a counter attack, but by January the danger had passed. As supplies poured

in through the port of Antwerp, preparations went steadily forward for the great assault on the German forces holding the Rhine barrier and on 8 February Operation "Veritable", the Canadian part of the general offensive, began.

DIVISIONAL MEDICAL SERVICES

1 November 1944 - 8 February 1945

During the long winter months the 4th Canadian Armoured Division was used in a patrolling role on the south bank of the Maas, although it had two periods, from 25 November to 5 December and from 21 to 24 December, at rest. During the patrols the divisional field ambulances operated with their brigade groups, while during their periods out of the line they operated sick bays holding up to 30 patients suffering from minor injuries or illnesses.

On 26 January 1945 the division mounted Operation "Elephant" to dislodge a small nest of fanatical German paratroopers who had succeeded in establishing a small bridgehead on the allied side of the Maas at Kapelsche Veer. For this operation No. 15 Canadian Field Ambulance reinforced its casualty collecting post at Loon op Zand and converted it into an advanced dressing station. Some 406 casualties from the operation were collected by the ambulance units and passed on to No. 2 Canadian Casualty Clearing Station at Tilburg.

The 2nd and 3rd Canadian Infantry Divisions, which had been out of action from 1-8 November, moved into the Nijmegen salient later in the month and remained in that key position until the opening of the spring offensive. In the 2nd Division the field ambulances operated casualty collecting posts in the brigade areas while No. 21 Canadian Field Dressing Station opened a divisional recovery centre to hold minor sick and injured. In the 3rd Division a somewhat different arrangement was in effect. For the first part of their stay in Nijmegen No. 23 Canadian Field Ambulance and No. 5 Canadian Field Dressing Station, with field surgical and field transfusion units attached, operated a surgical centre and divisional recovery centre in a former Jesuit college on the outskirts of the city. During December and January No. 22 Canadian Field Ambulance along with No. 7 Canadian Field Dressing Station and No. 6 Canadian Field Surgical Unit, took over the divisional recovery centre. Meanwhile No. 14 Canadian Field Ambulance, which was attached to the 7th Canadian Infantry Brigade, moved out to Mook on 26 December, returning to Nijmegen on 31 January.

No 17 Canadian Light Field Ambulance, after returning from Walcheren, spent a fortnight in Bruges refitting, and replacing the equipment it had lost in the operation. By 17 November the unit was in action again, operating casualty collecting posts with the various regiments of the 2nd Canadian Armoured Brigade near Grave, in Holland. During December

and January No. 17 Canadian Light Field Ambulance operated a brigade recovery centre. Again the ten-day holding instruction was observed, more serious cases being evacuated to Corps medical installations. This situation obtained until the middle of February, when sections attached to the regiments of the brigade began to move into Germany as the Canadian offensive went forward.

CORPS AND ARMY MEDICAL UNITS

1 November 1944 - 8 February 1945

For the first time since their arrival on the Continent medical units could function in a semi-static role and adopt an evacuation policy designed to conserve the strength of the Corps. Minor sick expected to recover within two weeks could be held, divisional medical units operating recovery centres and discharging fit casualties directly to reinforcement companies. Self-inflicted wounds were handled first by No. 5 and then by No. 11 Canadian Field Dressing Stations, to each of which a standing court martial was attached. Venereal disease cases, increasing in number, were treated at No. 1 Canadian Venereal Disease Treatment Unit, Nijmegen.

During the occupation of the Nijmegen salient battle casualties were few — less than ten per division per day — and an evacuation plan was worked out to distribute the work as evenly as possible. The 49th and 50th British Divisions and the 2nd Canadian Armoured Brigade evacuated casualties to No. 3 Canadian Casualty Clearing Station. The 2nd and 3rd Canadian Infantry Divisions sent Groups I and II cases to No. 5 Canadian Field Dressing Station (advanced surgical centre) and Group III cases to No. 6 Canadian Casualty Clearing Station.

During this time Brigadier Fenwick, D.D.M.S., First Canadian Army, had sites in the Breda area surveyed for their suitability as locations for army medical units to serve the troops which were to move into the Nijmegen salient. Tilburg appeared to offer the best possibilities and No. 88 British General Hospital was moved there on 9 November. This hospital acted as a staging unit for 2nd Canadian Corps casualties on their way to No. 6 Canadian General Hospital at Antwerp. Casualties fit for air evacuation were taken to No. 6 Canadian Field Dressing Station at Zeelst. 1st British Corps casualties were taken directly to hospitals at Antwerp. Care of troops in the Ghent area was the responsibility of No. 2 Canadian Casualty Clearing Station while No. 9 Canadian Field Dressing Station cared for non-evacuatable casualties in Cappellen.

Employment of General Hospitals

From 1 December until the end of hostilities movement of the larger hospitals was infrequent. Until the final rapid drive into Northern Holland and Germany there was nothing to be gained by uprooting a unit from

a satisfactory building and moving it a few miles forward where the process of repairing roof, windows, plumbing, and heating units would have to be repeated, if indeed a building could be found large enough to accommodate a hospital. Nos. 2, 10, and 12 Canadian General Hospitals remained respectively in Ghent, Turnhout, and St. Andre until disbanded, the first two in September, the third in November 1945. No. 20 moved in March 1945 from Antwerp to Turnhout, remaining there until disbanded in September 1945. This unit had arrived from England in December 1944 and had been operating at partial capacity and under great difficulty because of rocket attacks. No. 21 Canadian General Hospital moved from Mesniere en Bray to St. Omer on 9 January 1945 and remained there until proceeding to Turnhout where it was disbanded on 10 September 1945.

The amount of work of the 1200-bed hospitals varied considerably, but generally speaking they were never taxed. In fact, it was demonstrated that if all Canadian sick and wounded had been concentrated in Canadian hospitals not more than 41 per cent of the authorized number of beds would have been occupied at any one time. Some hospitals operated at full capacity at times. No. 12, for example, during the first month in which it operated at St. Andre, expanded from its original 50 beds of 5 October to 1200-beds on 4 November. During this time, 3934 casualties were admitted and 1860 operations performed. After the first week in November the admission rate dropped rapidly, only 3407 casualties being admitted during November and December.

What was true of the 1200-bed hospitals was less true of the 600-bed hospitals only because of the speed with which they could be opened to full war establishment and the greater ease in moving them when the situation warranted. No. 7 Canadian General Hospital arrived in Normandy on 15 July 1944 and operated at Bayeux until 7 September, receiving casualties in rotation with the other general hospitals in the Bayeux area. It moved to Martigny, near Dieppe, in September and operated until 24 November, when it moved to Turnhout. There it remained until it went to Germany on 1 May 1945. Due to persistent rocket attacks on Antwerp, Nos. 6 and 8 Canadian General Hospitals moved from this site in December to St. Michielsgestel. No. 16 remained at St. Omer, France, from 12 September 1944 until it moved to Oost Dunkirk, Belgium, on 8 January 1945. It moved on to St. Michielsgestel on 12 April and to Sgel, Germany, on 26 April.

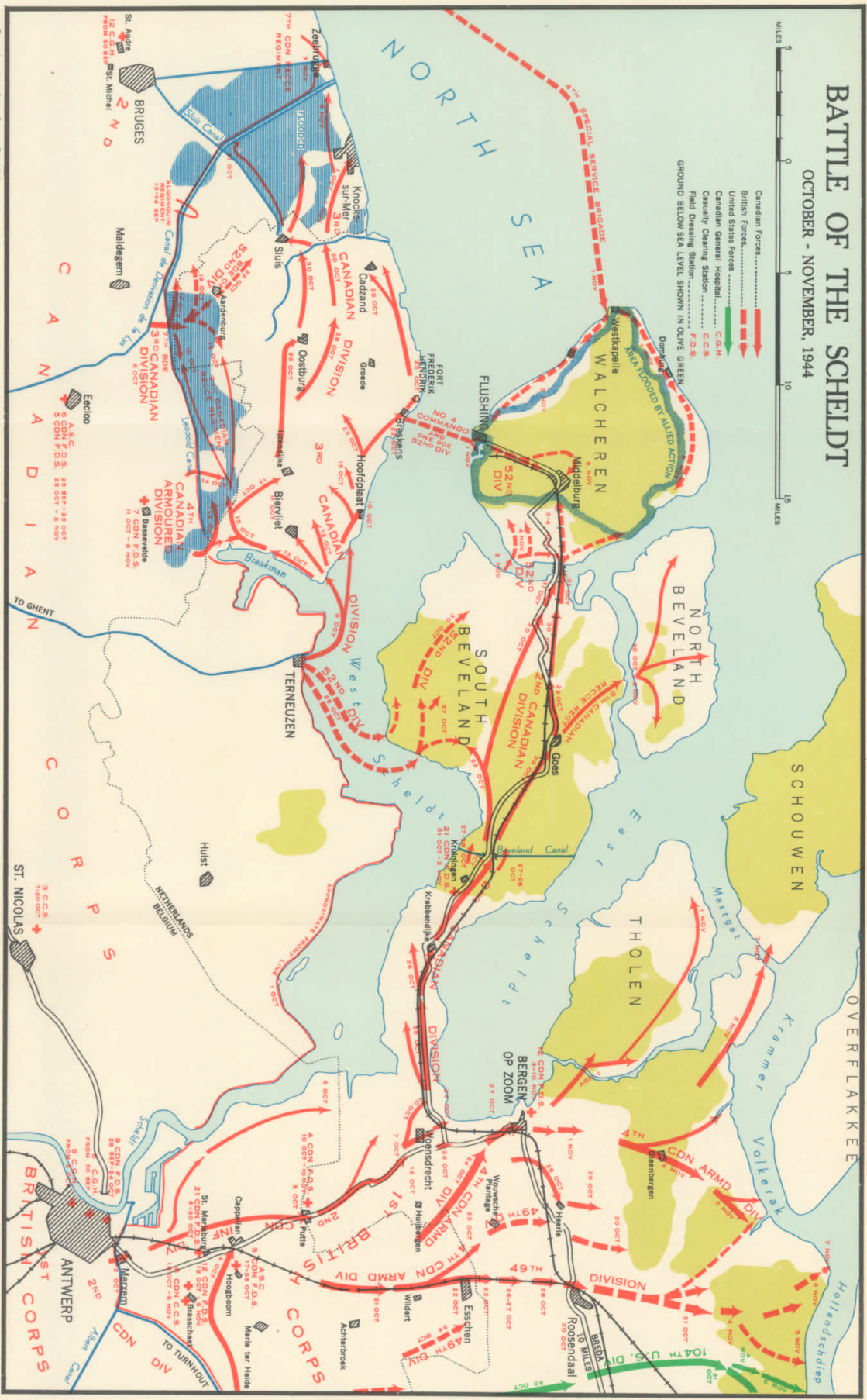
Six hundred-bed hospitals operated at a higher rate of bed occupancy than did the larger units, and all operated on a casualty clearing station basis at one time or another. No. 16 Canadian General Hospital from 18 September through October 1944 cleared from the Czech brigade around Dunkirk and from the Calais and Boulogne battles. During this period the beds occupied rose to 75 per cent and the hospital operated on a casualty clearing station basis. No. 8 Canadian General Hospital had a similar experience in St. Michielsgestel during Operation "Veritable" (February 1945) when bed

BATTLE OF THE SCHELDT

OCTOBER - NOVEMBER, 1944



- Canadian Forces.....
- British Forces.....
- United States Forces.....
- Canadian General Hospital..... C.G.H.
- Casualty Clearing Station..... C.C.S.
- Field Dressing Station..... F.D.S.
- GROUND BELOW SEA LEVEL SHOWN IN OLIVE GREEN



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Compiled and drawn by Historical Section G.S.

occupancy was 97 per cent. No. 7 Canadian General Hospital in August 1944 had 83 per cent of beds occupied and again in January and February ran around 70 per cent, expanding to 800 beds in its role as a casualty clearing station and rail transit hospital.

During the first six months in North-West Europe the Canadians had suffered 29,393 battle casualties including 7828 fatalities. Medical units had to deal with a much larger number of patients, as there were 20,944 sick admitted to hospital during the same period and a considerable number treated for minor ills and accidents in forward medical units and returned to duty without being admitted to hospital. During November and December battle casualties were only 1594 of which 377 were fatal. With the onset of winter, sickness kept the medical units occupied; during these months 8035 sick were admitted to hospital. Again a large number were treated by regimental medical officers and at divisional recovery centres without requiring hospitalization.*

* Figures for sickness do not include Canadians of other services, allied forces, civilians, or prisoners of war treated.

THE RHINELAND OFFENSIVE

From early November 1944 until early February 1945 the First Canadian Army held the line of the Maas and the Nijmegen salient. Before long it was to join in a mighty offensive which would carry the war into the heart of the enemy's country. During the last days of January, after the German Ardennes drive had been smashed, final preparations were made for the opening of the Operation known as "Veritable" which was to take the Army across the Maas and towards the Rhine River. The build-up for the attack was enormous, reminding more than one observer of the concentration which took place before the breakout from the Normandy bridgehead. Actually, so far as the First Canadian Army was concerned, it was so much larger that comparison is almost impossible; at one time in February General Crerar had under his command, 13 divisions, and the Army's strength rose above 380,000 men.

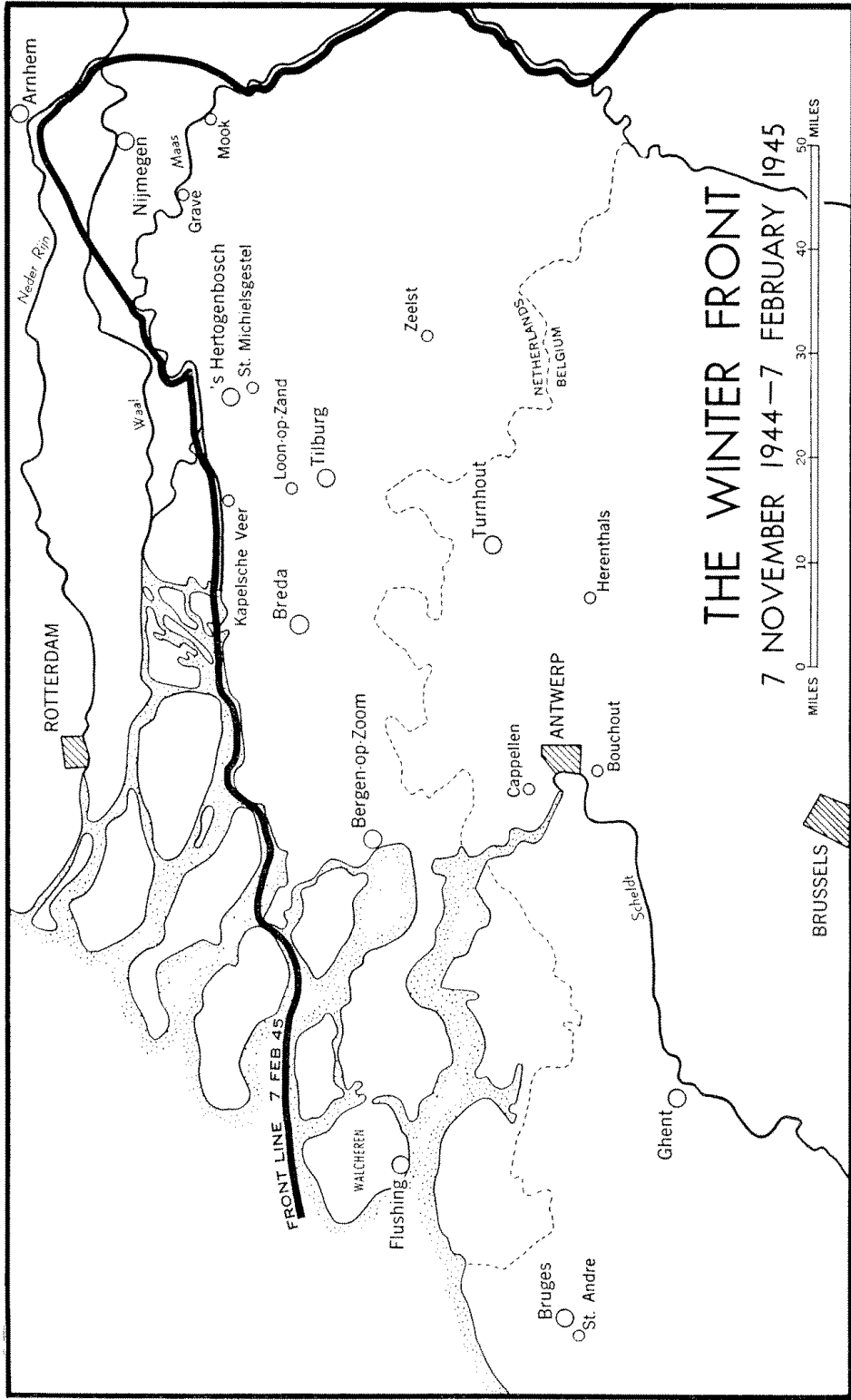
There were to be three major assaults on the Rhineland: in the north by Montgomery's 21st Army Group; in the centre by Omar Bradley's 12th (US) Army Group; in the Saar area by the 12th Army Group and the U.S. 3rd and 7th Armies. The first attack of the first major assault was to be carried out by the First Canadian Army and the United States 9th Army, temporarily attached to General Montgomery. "The Canadians were to attack south and south-east across the Maas River, while Simpson's Ninth Army would cross the Roer to advance north eastward. This would bring a converging effort upon the defending forces and drive them rapidly back to the Rhine".*

The Canadians launched their attack on 8 February and the assault wave was set in motion, rolling along towards the Rhine with precision and almost irresistible force. On 23 February General Bradley began his attack, and on 13 March the final converging thrust against the Saar began. By 25 March all organized resistance west of the Rhine was at an end.

FIRST CANADIAN ARMY MEDICAL PLAN FOR OPERATION "VERITABLE"

Because there had been a period of relative quiet in the Nijmegen salient so far as the medical situation was concerned, it was possible to develop an elaborate evacuation plan for the operation. First Canadian Army had its two most advanced hospitals, Nos. 6 and 8 Canadian General Hospitals, at St. Michielsgestel, the keystone of the evacuation plan. For Operation "Veritable" all casualties were pooled and control was maintained by Army through control posts, In preparation for the expected influx of a larger

* Eisenhower, Dwight, D., *Crusade in Europe* p. 374.



number of casualties than had been dealt with during the previous three months, Army and Corps medical installations were cleared of casualties except those unfit for evacuation. The 1st British Corps continued to hold casualties likely to recover within 14 days in casualty clearing stations; 2nd Canadian and 30th British Corps held only those likely to recover within 48 hours.

Casualties were estimated to be likely to reach 1000 daily, with a peak of from 2300 to 5000 on the third day of the operation, and an arrangement was made to separate different types of casualties for speedy treatment.

Casualties were to be evacuated from regimental aid posts to casualty collecting posts by jeep ambulance cars, Weasels and Buffaloes being used if water obstacles had to be crossed. The same vehicles were to be used to take them on to the advanced dressing station of the field ambulance. Battle casualties were to be passed on from the advanced dressing station by motor ambulance convoy to one of three ambulance control posts, which were under the control of the A.D.M.S., Army Troops, manned by field dressing station personnel and situated on the roads leading from the battle areas to Nijmegen. At the ambulance control posts the ambulance cars were to be directed to Corps casualty clearing stations or field dressing stations in the Nijmegen area, all of which were equipped to do surgery. From Corps medical units casualties were to be taken in ambulance cars along the Nijmegen-s'Hertogenbosch road to the fourth ambulance control post, which directed them to one of the eight hospitals available in the Army area. Several of these hospitals were equipped to handle special cases, No. 8 Canadian General at St. Michielsgestel had a maxillo-facial surgery team attached; No. 6 Canadian General had a neurosurgical team; No. 10 Canadian at Turnhout was equipped to handle chest wounds and more severe exhaustion cases. Non-battle casualties were to be separated out at the field ambulances. Civilian casualties were to go to St. Canisius Hospital, Nijmegen, military personnel with communicable diseases to No. 3 Canadian Casualty Clearing Station at Hees while minor sick were to be held at the divisional field dressing stations.

By 6 February medical units of the 2nd Canadian Infantry Division were in position and making final preparations for their role in the forthcoming attack. It was planned that No. 18 Canadian Field Ambulance was to clear casualties of the 5th Canadian Infantry Brigade Group to its casualty collecting post in Bergendahl. Casualties from the 4th and 6th Canadian Infantry Brigade Groups were to be cleared through the No. 10 Canadian Field Ambulance casualty collecting post at Malden. From these points casualties were to be taken by motor ambulance convoy either to No. 5 Canadian Field Dressing Station at Brakkenstein, No. 3 British Casualty Clearing Station in Marienbosch, No. 6 Canadian Casualty Clearing Station in Jonkerbosch, or No. 3 Canadian Casualty Clearing Station in Hees.

Jeep ambulances were assigned to duty with the brigades and additional ambulance cars were supplied to carry casualties from the casualty collecting posts and advanced dressing stations. Casualty collecting posts were opened by No. 10 Canadian Field Ambulance at Bisselt and Malden and by No. 18 Canadian Field Ambulance at Bergendahl, advanced dressing stations by Nos. 10 and 11 Canadian Field Ambulances in Nijmegen itself and by No. 18 Canadian Field Ambulance at Ewijk, some five miles northwest of the city on the banks of the Waal.

OPERATION "VERITABLE", 8-26 FEBRUARY

On the morning of 8 February the 2nd Canadian Infantry Division put in an attack on the northern flank of the 15th (Scottish) Division to clear a triangular area dominating the main road from Nijmegen to Cleve. It did its work rapidly and by nightfall had captured Wyler on the Nijmegen - Cleve road. During the first three days of fighting casualty collecting posts of the divisional ambulance units evacuated 145 casualties, of which only 75 were from the 2nd Canadian Infantry Division.

On the extreme left the 3rd Canadian Infantry Division began its advance into the flooded area between the Nijmegen — Cleve road and the Waal on the afternoon of 8 February. The 7th Canadian Infantry Brigade advanced as far as Zyfflich the first evening; on its left the 8th Brigade went through to Zandpol and Leuth. At times the water was three feet deep and hampered both the advance and the evacuation of casualties. Originally No. 22 Canadian Field Ambulance established a casualty collecting post on the Waal river four miles north east of Nijmegen. As a result of flooding it was forced to move back into Nijmegen and casualties were ferried from the forward regimental aid posts by Buffaloes, DUKWs, and Weasels. From the casualty collecting post they were passed on to the advanced dressing station of No. 14 Canadian Field Ambulance in Nijmegen and from there to the ambulance control post which directed them to one of the Corps casualty clearing or field dressing stations in the area. As the operation progressed the 8th Canadian Infantry Brigade replaced the 7th Canadian Infantry Brigade, held the cleared bank of the river, and proceeded to take Kekerdom, Milligen, and Keeken. Casualties from this area were cleared by No. 23 Canadian Field Ambulance casualty collecting post at Beek, on the Nijmegen — Cleve road, thence to the advanced dressing station of No. 22 Canadian Field Ambulance just south of the Nijmegen — Cleve road.

As the advance continued casualties were evacuated to No. 193 British Field Ambulance at Cleve. This advanced dressing station was a transshipment post and casualties were evacuated from it in DUKWs which had to cross about two miles of deeply flooded road between Kranenburg and Wyler on their way back to Nijmegen. Their run terminated at No. 3 British Casualty Clearing Station just outside Nijmegen where an ambulance control

post was in operation. From this point heavy ambulance cars could operate and casualties were taken to the Corps field dressing or casualty clearing stations. Evacuation by ambulance cars from Cleve to Nijmegen was never possible during the operation, and the facilities of the 15th (Scottish) Division at the DUKW loading point at Cleve were used until the end of the operation on 25 February, when it was taken over by No. 11 Canadian Field Ambulance. By that date the 3rd Canadian Infantry Division had fought through to Keppeln and was preparing to continue with the next phase of the operation known as "Blockbuster".

On completion of its initial drive in connection with Operation "Veritable" the 2nd Canadian Infantry Division had regrouped around Nijmegen in preparation for a further advance, and on coming under the 2nd Canadian Corps on 15 February began to move into concentration in the Cleve area. No. 11 Canadian Field Ambulance sent its headquarters and one company forward on 15 February with the 4th Canadian Infantry Brigade Group. The headquarters opened an advanced dressing station in Cleve while the company opened a casualty collecting post for the infantry brigades and evacuated casualties to the DUKW loading point at Cleve. From this point casualties were cleared by DUKWs over the flooded roads to Nijmegen. On 17 February the 6th Canadian Infantry Brigade Group with a company of No. 10 Canadian Field Ambulance, and on 18 February the 5th Canadian Infantry Brigade Group with a company of No. 18 Canadian Field Ambulance, moved into the Cleve area setting up casualty collecting posts and evacuating to the advanced dressing station of No. 11 Canadian Field Ambulance at Cleve.

On 19 February the 2nd Canadian Infantry Division, with the 43rd British Division on its left and the 3rd Canadian Infantry Division on its right, began to drive south-east towards Xanten. For this operation No. 11 Canadian Field Ambulance had opened a casualty collecting post at Bedburg, and by evening No. 18 Canadian Field Ambulance was able to move into this location and open an advanced dressing station while the casualty collecting post of No. 11 was augmented and became a divisional recovery centre. All casualties other than those for divisional recovery continued to be sent to the DUKW loading point.

One of the fiercest engagements along the Goch-Calcar road was fought by the 4th Canadian Infantry Brigade. The advance of the Essex Scottish and Royal Hamilton Light Infantry, which was supported by tanks and artillery, made good progress during the afternoon of 19 February, but the boggy ground hindered the progress of their armoured support and the arrival of fresh enemy units made their position desperate. The Essex Scottish were overrun on the night of 19-20 February and suffered severe losses until the Royal Regiment of Canada came in to restore the situation on the 20th.

Because of German counter attack some of the casualties were a considerable time in getting out of the field but they kept coming slowly, in quite good condition. . . .



EVACUATION BY JEEP AMBULANCE

Wounded are loaded into a jeep ambulance. The rain and windproof covering of these vehicles was of inestimable value in protecting casualties during the drive to medical installations in the rear. The scene is a regimental aid post near Keppeln, Germany, 25 February 1945.

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No. 18 Canadian Field Ambulance, which was operating an advanced dressing station for the whole Division handled 131 casualties during 20 February, of which 11 were prisoners of war. On 21 February a further attack by the Royal Winnipeg Rifles cleared the remainder of the Moyland Wood and opened the road to Calcar.

Canadian casualties evacuated by the medical units of the 2nd and 3rd Canadian Infantry Divisions during Operation "Veritable" (8-25 February) totalled 1532, of which the 2nd Canadian Infantry Division had 1100.

OPERATION "BLOCKBUSTER" 26 FEBRUARY - 10 MARCH

By 25 February the 2nd Canadian Corps was ready to launch Operation "Blockbuster", which involved a deliberate assault across the plateau between Calcar and Udem against the strong enemy defences of the Hochwald. Infantry of the 2nd and 3rd Canadian Divisions opened the initial assault early on 26 February, and in preparation for their action some minor changes were made in the disposition of the medical units. An advanced surgical centre at Bedburg was established by No. 5 Canadian Field Dressing Station and three days later, on 25 February, No. 3 Canadian Casualty Clearing Station moved into an adjoining block of buildings. The field dressing station took care of abdominal and chest cases while other Group I and II casualties were taken to the casualty clearing station. Less serious cases together with minor injuries and those unlikely to recover at the divisional recovery centres were taken to No. 6 Canadian Casualty Clearing Station at Nijmegen. The divisional recovery centres were operated by No. 11 Canadian Field Ambulance at Cleve for the 2nd Division, by No. 7 Canadian Field Dressing Station at Bedburg for the 3rd, and by No. 12 Canadian Field Dressing Station at Bedburg for the 4th Canadian Armoured Division. Evacuation from Corps to Army medical installations proceeded as outlined at the beginning of Operation "Veritable" and casualties were less than had been forecast.

Between the two Canadian infantry divisions which opened the assault on 26 February the 4th Canadian Armoured Division's armoured brigade began a simultaneous advance. Field ambulances with the three divisions set up advanced dressing stations and casualty collecting posts well forward. As the operation progressed advanced dressing stations were leap-frogged forward and the casualty collecting posts cleared casualties to the nearest open advanced dressing station from which they were taken back to Bedburg medical centre for further treatment or evacuation.

On the first day of the operation the number of casualties, although high, was less than had been expected, and the increasing proportion of prisoners of war showed that the initial drive had overrun many enemy positions. During the day No. 18 Canadian Field Ambulance at Bedburg treated 107 wounded prisoners of war in addition to 260 Canadian and

allied soldiers. On 1 March there was bitter fighting in the Hochwald and Balberger Wald as the Canadian infantry renewed the assault on the forest ridge. For three days stubborn resistance continued, and it was not until the evening of 4 March that it could be said that the Hochwald and Balberger Wald were clear.

Forward medical units had been moved up as the battle progressed, field ambulances maintaining casualty collecting for their respective brigades, and casualties being evacuated to the nearest advanced dressing station, No. 18 Canadian Field Ambulance had opened an advanced dressing station at Udem for casualties of the 2nd Canadian Infantry Division on 1 March, and on 4 March an advanced surgical centre operated by No. 12 Canadian Field Dressing Station opened in an adjoining building and received very urgent cases, others being evacuated to the medical centre at Bedburg. As further progress was made No. 10 Canadian Field Ambulance moved up to the western edge of the Hochwald on 4 March, and two days later moved up again to Marienbaum. No. 11 Canadian Field Ambulance, now operating the DUKW loading point at Cleve, cleared up to 500 casualties to the Nijmegen medical area in a single day.

From 3 March, when it moved to Udem, No. 14 Canadian Field Ambulance cleared all 3rd Division casualties through its advanced dressing station while Nos. 22 and 23 continued to operate casualty collecting posts which moved forward as the Division advanced.

Evacuation of 4th Canadian Armoured Division casualties was organized on a similar basis. No. 12 Canadian Light Field Ambulance operated an advanced dressing station at the opening of the operation and was leap-frogged by No. 15 Canadian Field Ambulance as the Division moved forward. No. 12 Canadian Field Dressing Station besides acting as advanced surgical centre provided a divisional recovery centre at Udem from 2 March.

Generally speaking casualties during "Blockbuster" were slightly heavier than they had been during "Veritable". As nearly as it was possible to compute the number of casualties of a single operation, the figure given for those of the First Canadian Army during "Veritable" was 5422, about equally divided between the 2nd Canadian and the 30th British Corps. During "Blockbuster" the figure was 5805, with a slightly higher proportion of Canadians in this case.

While the Canadian Army had been fighting its way in a south easterly direction from Nijmegen the Ninth United States Army had been driving up in a north easterly direction. When Operation "Veritable", with its sub operation "Blockbuster", drew to a close allied forces held the west bank of the Rhine along a front extending from Dusseldorf to Nijmegen.

During Operations "Veritable" and "Blockbuster" the weather and the flooding of great areas of the battle zone provided almost as much opposition as the enemy. Many casualties were caused by Schu mines which had been sown indiscriminately over the fighting zone. Difficult to detect because of



The National Gallery of Canada

From a painting by Capt. D. A. Colville

CASUALTY COLLECTING POST NEAR UDEM, GERMANY

The deep hollow afforded some shelter in this open country to the casualty collecting post opened by No. 14 Field Ambulance on 27 February 1945, the second day of Operation "Blockbuster". The slits are being dug for protection against shellfire.

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their predominantly wooden construction, these weapons accounted for a large number of fatalities and maimed many Canadian soldiers in the opening stages of the operation. However, as the enemy was driven closer to the Rhine in the last stages of the battle, this type of casualty diminished considerably, while forward surgery with the consequent early treatment of these cases also helped to reduce the fatalities among the fighting troops.

The terrific air and artillery bombardments which preceded the various phases of the month-long operation had almost completely demolished the principal towns in the attack zone, and in many cases forward medical units had to operate under canvas for the first time since the Scheldt battles. In most instances a building was secured for the housing of casualties, although the staff had to content itself with canvas accommodation.

Aside from flooding on the road between Kranenburg and Nijmegen, which forced medical evacuation units to use amphibious vehicles, there was little difficulty in getting casualties back from the advanced dressing stations and through to the general hospitals. From 10 February to 10 March, 20,640 casualties of all types were evacuated from the battle area — 5689 by road, 4275 by air, and 10,676 by ambulance train.

FIRST CANADIAN CORPS ENTERS NORTH-WEST EUROPE FEBRUARY - MARCH 1945

During February, units of the 1st Canadian Corps began to arrive in Southern Belgium after their long trip from Italy. By mid-March all units of the 5th Canadian Armoured Division were in Belgium, and they were joined before the end of the month by those of the 1st Canadian Infantry Division. Corps and Divisional troops were concentrated in three areas: Corps Troops in the Courtrai area, the 5th Canadian Armoured Division on the left around Ypres, and the 1st Canadian Infantry Division on the right in the country north of Grammont. As units began to arrive in the concentration areas during the last week of February advantage was taken of permission granted by 21st Army Group for casualties to be evacuated by regimental medical officers to any of the numerous hospitals conveniently situated in or near these areas.

No. 4 Canadian Casualty Clearing Station arrived on 9 March, and as elements of No. 1 Canadian Motor Ambulance Convoy had also arrived it was possible to co-ordinate evacuation of Canadian casualties to No. 4 at Petegem and from there to No. 2 Canadian General Hospital when necessary. On 13 March the 1st Canadian Corps moved to Wischen in the Nijmegen area and on 15 March, with the 49th (West Riding) Infantry Division under command, assumed responsibility for the sector at the time held by that division. With the 1st British Corps in position on the left, the 2nd Canadian Corps on the right, and the 1st Canadian Corps in the centre, for the first time the two Canadian Corps were to fight side by side.

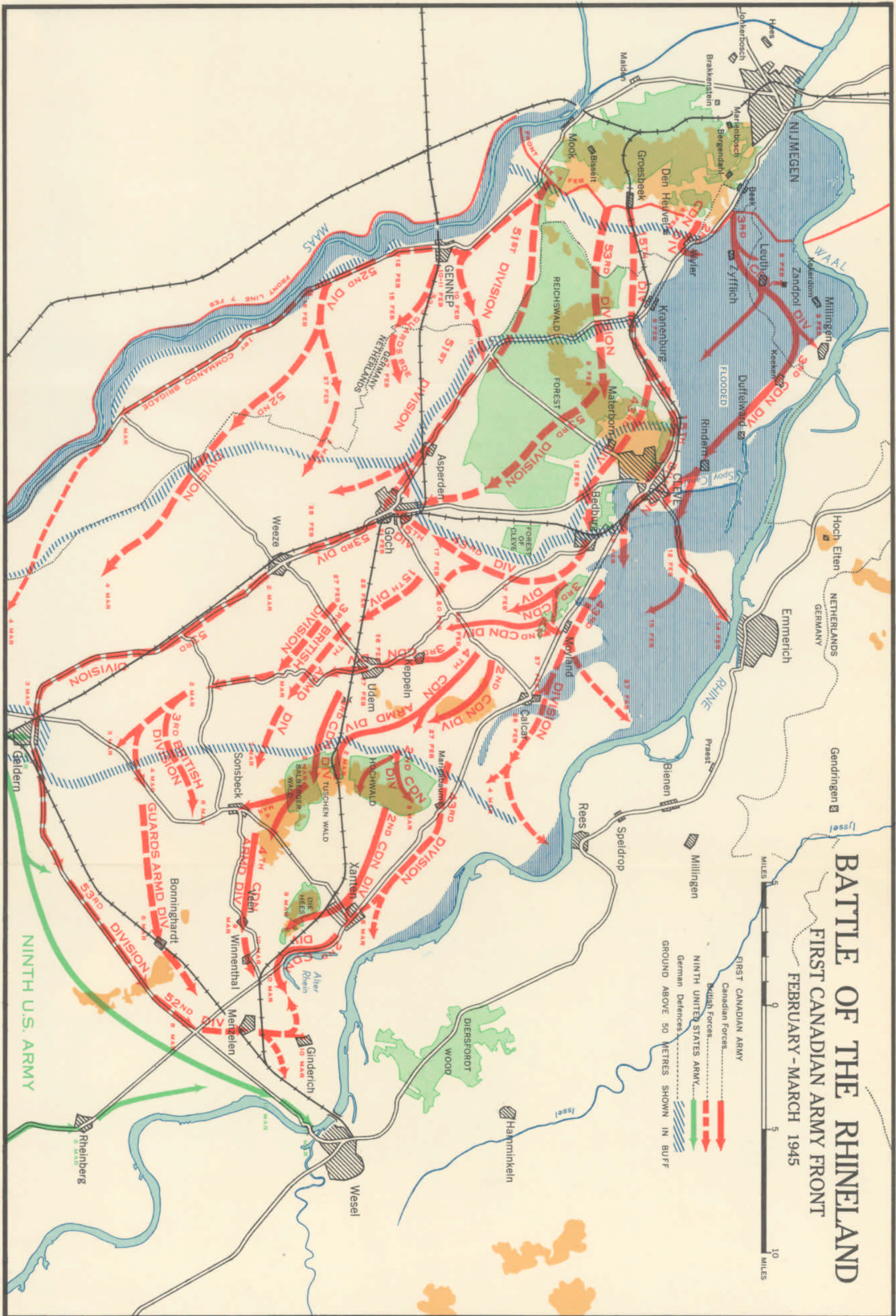
Formidable water obstacles separated the 1st Canadian Corps from the enemy, and activity until 2 April was confined to patrolling along the Maas, so that casualties were relatively few. However, the two weeks were not wasted; on 15 March the 5th Canadian Armoured Division was reorganized from an armoured division consisting of one armoured brigade and two infantry brigades to the standard armoured division of one armoured and one infantry brigade. As a consequence of this reorganization the medical services of the 5th Canadian Armoured Division, consisting of three light field ambulances and one field hygiene section, were reorganized to one heavy field ambulance, one light field ambulance, one field dressing station, and one field hygiene section.

Orders for the reorganization of the divisional medical service were received from the D.D.M.S., 1st Canadian Corps, on 12 March. Surplus personnel resulting from the disbandment of No. 8 Canadian Light Field Ambulance and its reorganization as No. 8 Canadian Field Dressing Station were transferred to No. 24 Canadian Field Ambulance to bring it up to strength. Vehicles were obtained from the same source, and the equipment of two sections of the former light field ambulance provided the necessary material for the extra two sections of the heavy field ambulance.

By 15 March the medical reorganization was completed. No. 24 Canadian Light Field Ambulance had become No. 24 Canadian Field Ambulance; No. 8 Canadian Light Field Ambulance had become No. 8 Canadian Field Dressing Station and reverted to the command of the 1st Canadian Corps; No. 13 Canadian Field Dressing Station returned to the 5th Canadian Armoured Division from under command of the 1st Canadian Corps. The only other change in the medical organization was that the divisional field hygiene section, No. 11 Canadian Field Hygiene Section, lost its typhus increment which had been authorized for the central Mediterranean theatre.

The 1st Canadian Infantry Division, which arrived in North-West Europe later than the 5th Canadian Armoured Division undertook a short period in which to rest, refit, and reorganize before being committed in the 1st Canadian Corps sector. As a result the field ambulance units were ordered to be brought from the light to standard field ambulance establishment. This called for a considerable increase in manpower and equipment and it was not possible to carry out the necessary changes immediately. But by the end of March a beginning had been made.

On 27 March elements of the 5th Canadian Armoured Division began to move out of their concentration area in Belgium toward Nijmegen, coming under command of the 1st Canadian Corps on 1 April. The 1st Canadian Infantry Division was still arriving in its initial concentration area on 27 March, but began to move forward to a concentration area in the Reichswald on 4 April. It remained under the 2nd Canadian Corps command until it struck across the Ijssel river and came under command of the 1st Canadian Corps on 13 April.



THE FINAL PHASE AND OCCUPATION

THE RHINE CROSSING, 23 MARCH - 1 APRIL 1945

When Operation "Veritable" was completed the First Canadian Army undertook the task of holding the front while forces were re-grouped for the Rhine crossing. This time General Crerar's front line ran from Emmerich to the sea. The 2nd Canadian Corps passed under control of General Dempsey's Second British Army for the initial phase of the new operation. The main attack across the Rhine was to be launched north of the Ruhr with a strong secondary thrust in the Frankfurt area. The 9th Canadian Infantry Brigade under command of the 51st (Highland) Division was to take part in the initial assault. In preparation, widespread bombing was carried out and a mass of amphibious vehicles and artillery assembled behind a 50-mile smoke screen.

As a result of the re-grouping and the roiling up of the Army rear boundary there was some movement of medical installations. The Nijmegen area became, from a medical point of view, the Army rear boundary. Both rail and air evacuation were available from there, and the bed capacity of the Nijmegen group of hospitals was increased by the addition of No. 1 Canadian General Hospital (600 beds), newly arrived from Italy. Attached to this hospital were No. 1 Canadian Mobile Neurosurgical Unit and No. 6 British Maxillo-facial Unit. The special surgical team for chest cases was then brought up from No. 10 Canadian General Hospital at Turnhout to No. 8 Canadian General Hospital at St. Micheilsgestel.

It was agreed with Second British Army that Canadian casualties would pass through Canadian medical installations. An arrangement was therefore made to have them returned from divisional medical units across the Rhine in the vicinity of Rees to No. 3 Canadian Casualty Clearing Station at Bedburg and thence to the Nijmegen group of hospitals, from which they would be moved by air, rail, or road to the base hospitals on the Continent or in the United Kingdom.

Operation "Veritable" had been launched at a time when weather conditions made a particularly wet part of the European continent about as wet and muddy as it could possibly be. By the end of March spring was on its way and the assembling of units for the new stroke was somewhat simplified.

Operation "Plunder", as the drive over the Rhine was called, began on the evening of 23 March. The 51st (Highland) Division began its attack across the river at nine o'clock and in the initial assault met only light opposition. The 9th Canadian Infantry Brigade set out across the Rhine near Rees some seven hours after the first troops of the Highland Division.

Ordered to attack the village of Speldrop some three miles beyond, the brigade met stiff opposition from the defending paratroops and only succeeded in clearing it on 25 March.

On the morning of the 24th Operation "Varsity", one of the most successful airborne operations carried out during the war, was undertaken by the 6th Airborne Division, which included the 1st Canadian Parachute Battalion. As a result of his heroic action in caring for the wounded of the battalion and displaying "sustained gallantry of the highest order, for six hours, most of the time in great pain", Corporal F. G. Topham, a battalion medical orderly, received the Victoria Cross.

General Eisenhower considered that the operations of 24 March sealed the fate of Germany. The enemy's reserves had been used up; there were no more large water barriers to hold up the allies, and the air forces were hammering continuously at the German supply depots and communication lines. From the day of the Rhine crossing the advance was accelerated continuously until the whole German military organization collapsed.

MEDICAL UNITS IN THE RHINE CROSSING

The assault casualty collecting post of No. 23 Canadian Field Ambulance crossed the Rhine in the early hours of 24 March with the 9th Canadian Infantry Brigade and established a collecting post in the bridgehead, evacuating casualties to one of four casualty evacuation posts operated by the 51st (Highland) Division on the east bank of the Rhine. From here casualties were taken by assault craft to the disembarkation points west of the river, thence to the advanced dressing stations of Nos. 8 or 223 British Field Ambulances and from these by ambulance car to No. 3 Canadian Casualty Clearing Station at Bedburg.

On the night of 27-28 March the advanced dressing station of No. 23 Canadian Field Ambulance crossed "Waterloo" bridge and joined its casualty collecting post in the bridgehead. The casualty collecting post was then divided into two parts, one remaining at its present location and the other moving about three miles further south. On 28 March the advanced dressing station moved out to a new site near Praest.

The 3rd Canadian Infantry Division had come back under command of 2nd Canadian Corps on 28 March, and the advanced dressing station at Praest was in an excellent position to evacuate casualties from the 7th and 8th Canadian Infantry Brigades, which were forcing their way into Emmerich.

As the month of March drew to a close all the field ambulances of the 3rd Canadian Infantry Division were across the Rhine. Casualty collecting posts had been set up in Emmerich while the advanced dressing station. Of No. 23 remained at Praest and continued to evacuate the divisional casualties. No. 7 Canadian Field Dressing Station, meanwhile, remained at Cleve to care for divisional troops west of the Rhine.

Divisional casualties for the operation up to 31 March were remarkably light in view of the type of water-borne assault which had to be made and the hand to hand fighting which took place in the rubble that had been Speldrop and Emmerich. In the course of attaining its objectives the 3rd Canadian Infantry Division had evacuated 205 battle casualties and 55 others.

The 2nd Canadian Infantry Division, which had been concentrated in the Reichswald area following Operation "Blockbuster", re-entered the battle when the 6th Canadian Infantry Brigade crossed the Rhine on 28 March to take over from the 3rd Division's 9th Brigade in the area between Bienen and Praest. No. 10 Canadian Field Ambulance crossed with the brigade and set up an advanced dressing station at Bienen. On the two following days Nos. 18 and 11 Canadian Field Ambulances crossed with their respective brigades. By the end of March the Division was operating on a one brigade front north from Gendringen, with all brigades evacuating through the advanced dressing station of No. 18 Canadian Field Ambulance at Gendringen; No. 4 Canadian Field Dressing Station remained open at Cleve to care for divisional troops in the rear areas and to hold minor sick and injured.

Following Operation "Blockbuster" the 4th Canadian Armoured Division returned to Army reserve in the Tilburg area. Medical installations were kept to a minimum to give personnel an opportunity for rest, recreation, and preparation for the next move forward. From 23 to 30 March the division gave effective fire support to the Rhine crossing with its whole tank strength firing as artillery.

No. 12 Canadian Light Field Ambulance evacuated casualties from the armoured brigade group, the engineers, and artillery, while No. 15 Canadian Field Ambulance cleared from the remainder of the Division. Fortunately casualties were light despite counter artillery fire and strafing by enemy planes. When it finished its job of supporting the infantry divisions on 31 March the 4th Canadian Armoured Division began crossing the Rhine to concentrate in the Speldrop area for a push north-east into the heart of Germany.

Because the armoured regiments of the 2nd Canadian Armoured Brigade were used almost exclusively to support the 2nd and 3rd Canadian Infantry Divisions during the advance to and across the Rhine, No. 17 Canadian Light Field Ambulance found itself split into sections and operating over a wide area. Some of these sections set up casualty collecting posts from which casualties were evacuated to the advanced dressing station of the division to which the regiment was attached. Other elements of the unit were loaned to an infantry brigade of the Royal Marines for the latter part of March.

At midnight on 1 April the 2nd Canadian Corps returned to General Crerar's command as units of the 4th Canadian Armoured Division rolled across the Rhine to join those of the 2nd and 3rd Canadian Infantry Divisions already in the area.

THE LIBERATION OF HOLLAND, APRIL 1945

The new task of the 21st Army Group was to reach the line of the Elbe and to reduce the ports of Bremlen and Hamburg. Within this plan the First Canadian Army was to clear North-East Holland and the German coast as far as the mouth of the Weser; this particular task fell to the 2nd Canadian Corps. The 1st Corps was to liberate Western Holland. Far to the south the Ninth United States Army had swung round to join the First United States Army and complete the encirclement of the Ruhr. Between them and the Canadians the Second British Army was beginning its drive through Osnabreck and towards the Weser south of Bremen.

The operation of the Canadian Army from 1 April to the end of the war was somewhat similar to its role after the Seine crossing in the previous September. During the earlier operation the Canadian units had crossed the river on a fairly restricted front and then fanned out over the whole coastal region of northern France and Belgium. Now in this last phase of the war they carried out a similar movement. Although the 9th Infantry Brigade was the only Canadian infantry formation that had taken part in the actual assault across the Rhine, the remainder of the 3rd Division came into the fight on 28 March, and once the bridgehead had been established it was followed by the 2nd Canadian Infantry and 4th Canadian Armoured Divisions.

The grouping of Canadian units on 1 April in the old Nijmegen salient and across the Rhine in the Emmerich area made the medical problem, for the moment, relatively simple. All casualties were cleared through divisional and corps resources to an ambulance control post in Nijmegen and thence to the group of hospitals and casualty clearing stations in that town. Evacuation from Nijmegen was placed under the control of an evacuation officer. On 1 April air evacuation began from an airstrip within three miles of the Nijmegen hospital group, and rail and road evacuation from Nijmegen back to No. 8 Canadian General Hospital at St. Micheilsgestel completed the arrangements.

The problem of medical supplies was gradually coming less serious as the provision of rail, sea, and air transport became easier. By the first week of March it was possible to hold cases which were expected to be fully recovered in 42 days, and even First Canadian Army casualty clearing stations and 200-bed general hospitals were holding casualties for 14 days.

NORTHERN HOLLAND

In the new series of operations to be undertaken by the 2nd Canadian Corps the 3rd Division was given the task of clearing the east bank of the IJssel River which links the IJsselmeer, once known as the Zuider Zee, and the Rhine just up river from Arnhem. Advancing northward from Emmerich on 1 April, leading elements of the division soon crossed into Holland again, In support of the advance the field ambulances moved with their respective

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CROSSING THE RHINE

A casualty is carried by stretcher to safety, while soldiers of the Stormont, Dundas and Glengarry Highlanders prepare to cross the Rhine near Rees, March 1945.

brigades. No. 14 Canadian Field Ambulance opened an advanced dressing station in the monastery at 's Heerenberg about three miles north of Emmerich, on the evening of 1 April, and for the first three days of April all casualties in the divisional area were cleared from the advanced dressing station by motor ambulance convoy to Bedburg, crossing the Rhine at Rees and later at Emmerich. On 3 April No. 2 Canadian Casualty Clearing Station opened at 's Heerenberg in the same building that had been used by No. 14 Canadian Field Ambulance, and thereafter until 15 April casualties were evacuated to that point.

The advance of the Division was so rapid during the month of April that advanced dressing stations were scarcely opened before the brigades which they were designed to serve were almost out of reach and the field ambulance had to pack up and take to the road. No. 14 Canadian Field Ambulance, for example, moved eleven times during the month and the other field ambulances had a similar problem. In an attempt to provide adequate medical care in spite of the rapid advance the dressing stations of the field ambulances, while remaining under command of the A.D.M.S., were put in support of the infantry brigades and moved with them. In the case of units which were being used to contain pockets of enemy resistance and were temporarily left behind by the advancing brigades, the regimental aid posts usually evacuated casualties to the nearest casualty collecting post or advanced dressing station whether it was supporting their brigade or not. Similarly the casualty collecting posts of the field ambulances evacuated casualties to the nearest open advanced dressing station which in some cases was not their parent unit.

By 18 April advanced elements of the 3rd Canadian Infantry Division had reached the coast north of Leeuwarden, an advance of 150 miles in less than a month. Up to 21 April medical units of the Division evacuated 1703 casualties, of which only 613 were due to enemy action.

The 2nd Canadian Infantry Division, operating on the right of the 3rd, followed an almost parallel course which was to take it up across the Twente Canal and on to Groningen and Zoutkamp on the North Sea. The advance was rapid and divisional medical units were hard pressed to keep pace with the advancing troops.

In the early stages of the northward thrust, chest and abdominal cases were evacuated from the advanced dressing stations to No. 21 Canadian Field Dressing Stations's advanced surgical centre in Emmerich, while all other casualties went on to No. 3 Canadian Casualty Clearing Station at Bedburg. The journey to Bedburg required a round trip of almost 60 miles and was not entirely satisfactory as roads were extremely rough and heavily congested. Fortunately casualties were not heavy; No. 18 Canadian Field Ambulance evacuated only six due to enemy action on 6 April although shelling on the following day caused 39 more casualties.

With the opening of a venereal disease and exhaustion centre at Diepenheim by No. 10 Canadian Field Dressing Station, and of a divisional recovery centre at Kasteel Ampsen by No. 4 Canadian Field Dressing Station, a new evacuation plan came into effect. From 8 April casualties were segregated at the advanced dressing station for dispatch to the appropriate medical installation. Despite the change, No. 3 Canadian Casualty Clearing Station now at Lochem continued to receive all those requiring surgery beyond the resources of the divisional recovery centre.

In anticipation of strong enemy resistance at Groningen and due to the extended lines of evacuation, No. 5 Canadian Field Dressing Station opened an advanced surgical centre at Beilen on 13 April and on the following day No. 4 opened a divisional recovery centre at Assen. Groningen fell on 16 April and, as Zoutkamp had been occupied the previous day, the division's task was now completed.

During the 17-day period medical units of the 2nd Division had evacuated 1376 Canadian casualties, of which 581 were due to enemy action. It was fortunate that the number of those requiring evacuation beyond the division was not higher. By 17 April the advanced surgical centre at Beilen was 25 miles and No. 3 Canadian Casualty Clearing Station at Lochem 75 miles from the divisional advanced dressing station operated by No. 18 Canadian Field Ambulance at Paterswolde, and the strain on ambulance resources of the Division was severe.

On the right of the 2nd Canadian Infantry Division, the 4th Canadian Armoured Division drove northward across the Twente Canal on 3 April, crossed the Ems River on the 7th, proceeded through Meppen and Sgel, cleared Friesoythe on the 15th, and then crossed the Kusten Canal in the direction of Bad Zwischenahn. The latter city surrendered on 1 May, after which the division was given the new task of sealing off the north westerly approaches to Oldenburg.

For the northward drive the Division returned to its original form operating in two brigade groups, the 4th Armoured and the 10th Infantry. These two groups were supported respectively by No. 12 Canadian Light Field Ambulance and No. 15 Canadian Field Ambulance.

In this case, also, medical units experienced great difficulty in keeping up with the troops. Initially, casualties were evacuated to the advanced surgical centre operated by No. 21 Canadian Field Dressing Station at Emmerich. However, as the lines of evacuation lengthened, No. 6 Canadian Field Dressing Station opened an advanced surgical centre at Almelo on 7 April, moving to Meppen on the 11th and to Friesoythe on the 15th. Moreover, the divisional recovery centre, No. 12 Canadian Field Dressing Station, closely followed the troops. In a succession of rapid moves between 1 and 19 April, it went from Cleve to Friesoythe.

During the first week in April a number of Corps and Army medical units changed their locations as forces across the Rhine moved farther

from what had been the old Nijmegen salient. No. 4 Canadian Casualty Clearing Station replaced No. 2 at Nijmegen to allow the latter to move forward to 's Heerenberg, near Emmerich, and No. 3 moved from Bedburg to Lochem. At this time the specialist services including exhaustion, maxillo-facial, neurosurgical, and eye surgery, together with self-inflicted wound casualties, were grouped in Nijmegen.

Arrangements were made to direct all casualties from Corps areas to the ambulance control post at Marienboom, just outside Nijmegen, which then routed them to the appropriate army medical unit. On 11 April, because of the rapid advance of 2nd Canadian Corps, No. 6 Canadian General Hospital was moved from St. Michielsgestel to Ootmarsum, and on 13 April No. 2 Canadian Casualty Clearing Station moved up from 's Heerenberg to Meppen. With the exception of these changes, which relieved the pressure on the 2nd Canadian Corps evacuation route, there were few changes in evacuation arrangements at Corps and Army level until almost the end of April.

WESTERN HOLLAND

The first of April found the 1st Canadian Corps, with the 49th (West Riding) Division under command, occupying positions in the Nijmegen bridgehead south of Arnhem. The Corps front extended from just north of Nijmegen southwestward for 25 miles to a point on the Maas, near Heerewarden. The initial task of the 1st Canadian Corps was to clear the "island" between the Neder Rijn and the Waal in the 49th sector. Attacking on 2 April the 49th Division, with the 11th Canadian Infantry Brigade under command, made rapid progress and on the following day was well established between the Neder Rijn and Ijssel rivers.

It was originally intended that the Canadian Army would attack the Ijssel River defences (designed primarily against attack from the west) from the east, capture Deventer and Zutphen, cross the Ijssel to take Apeldoorn and then bridge the Neder Rijn at Arnhem, thereby opening a supply route to the north-east. This move would also secure a strong left flank protecting operations in northern Holland. It was thought probable that the enemy might evacuate the western Netherlands, "a likelihood which would be increased as the 2nd Canadian Corps pursued its northward advance". The enemy did not withdraw and in view of the wretched condition of the population in this sector and the continued appeals on its behalf by the Dutch government, it was decided, on 5 April, that the "methodical" clearing of western Holland would be undertaken.

By this time the 1st Canadian Corps was well established between the Neder Rijn and the Ijssel. On 14 April the 49th Division, attacking from the west, cleared Arnhem and on the same day the 1st Canadian Infantry Division, having already crossed the Ijssel, reached the outskirts of Apeldoorn.

The next day the 5th Canadian Armoured Division began a drive from Arnhem to the shore of the IJsselmeer in a move designed to cut off the enemy still resisting about Apeldoorn. This drive forced the Germans in Apeldoorn to withdraw, and on the 17th the 1st Division occupied this town. Part of the withdrawing force blundered into the 5th Division's Headquarters. A violent struggle, the "Battle of Otterloo", ensued in which staff officers, clerks, runners, signallers, batmen, drivers, and cooks joined in the fighting. The Army Service Corps personnel of the medical unit, No. 24 Canadian Field Ambulance, were forced to take up arms to defend the patients. On 18 April the 5th Canadian Armoured Division completed its drive to the IJsselmeer.

For the initial thrust of the 49th (West Riding) Division, No. 24 Canadian Field Ambulance, in support of the 11th Canadian Infantry Brigade, did not open an advanced dressing station, but evacuated directly to a British field ambulance. On 4 April No. 4 Canadian Casualty Clearing Station with field surgical and field transfusion units attached, opened near Nijmegen for all casualties from the 11th Canadian Infantry Brigade as well as the 49th Division. Exhaustion and venereal disease cases were evacuated to No. 1 Canadian Exhaustion or No. 1 Canadian Venereal Disease Treatment Unit located with No. 10 Canadian Field Dressing Station near Nijmegen.

In support of the 1st Canadian Infantry Division's drive towards Apeldoorn, each field ambulance formed casualty collecting posts for its brigade, while No. 9 Canadian Field Ambulance provided a divisional advanced dressing station at Gorssel from 9 to 17 April. In the opening phase Groups I and II casualties were evacuated to No. 3 Canadian Casualty Clearing Station at Lochem. Group III casualties were taken to No. 2 Canadian Casualty Clearing Station at 's Heerenberg. On 13 April No. 2 Canadian Field Dressing Station moved into the bridgehead across the IJssel, and on the following day, when field surgical and field transfusion units arrived, established an advanced surgical centre for Groups I and II casualties. The evacuation time was thus shortened from seven to two and a half hours. Group III casualties were then evacuated to No. 3 Canadian Casualty Clearing Station at Lochem.

Following the fall of Apeldoorn the advance of the division was extremely rapid. To cover the evacuation requirements, No. 9 Canadian Field Ambulance opened an advanced dressing station at Apeldoorn on 17 April but moved to a point north-east of Barneveld on the following day. No. 4 then moved into Apeldoorn as a recovery centre for minor sick.

To support the 5th Canadian Armoured Division's operation, No. 7 Canadian Light Field Ambulance opened an advanced dressing station in Arnhem on the morning of 15 April and began evacuating casualties from the divisional attack. "The flow of casualties was never heavy although continuous throughout the day. All casualties were evacuated by a devious route over the IJssel by a bridge, across the Neder Rijn by car ferry, thence to No. 4 Canadian Casualty Clearing Station at Nijmegen. The trip required



The National Gallery of Canada

From a painting by Capt. G. C. Tinning

AN ADVANCED DRESSING STATION IN HOLLAND

During the early part of the operations for the liberation of Western Holland, the advanced dressing station of No. 24 Field Ambulance was located in an orchard about five miles north-west of Nijmegen, April 1945. Standing by are ambulances of No. 1 Motor Ambulance Convoy.

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two and a half hours by day and three by night". The opening of a pontoon bridge at the ferry site during the afternoon shortened the journey to one hour, but in the opinion of the A.D.M.S. this was still much too long for Groups I and II casualties. The situation was relieved when No. 13 Canadian Field Dressing Station, a divisional unit, moved up to Arnhem, a looted and deserted city, to open an advanced surgical centre on the 16th. During the first two days of operation this surgical centre admitted 65 casualties of which 32 required surgery. Many of these were from the "Battle of Otterloo", evacuated by No. 24 Canadian Field Ambulance which had set up an advanced dressing station at Otterloo on 16 April.

As the Division advanced northward No. 7 Canadian Light Field Ambulance opened an advanced dressing station at Barneveld on the morning of 18 April and a light one at Putten, some eight miles further north, in the afternoon. From this date until the end of the operation No. 7 evacuated all divisional casualties. Groups I and II casualties continued to be evacuated to the advanced surgical centre at Arnhem, while Group III casualties were now sent to No. 3 Canadian General Hospital which had begun operating at Marienboom, near Nijmegen, on 7 April.

By 18 April 1st Canadian Corps was in position on an arc running south from Harderwijk on the IJsselmeer, through Barneveld to Renkum on the Neder Rijn; on the right flank the 1st Canadian Infantry Division occupied the sector just south of Barneveld to the IJsselmeer, while the 49th Division held the line from Barneveld to Wageningen on the Neder Rijn. Between the Neder Rijn and the Waal and along its southern bank the line was manned by 1st Canadian Armoured Brigade and a brigade of Belgian infantry.

By 21 April some additional changes had taken place. No. 2 Canadian Field Dressing Station took over a German hospital in Apeldoorn from No. 5 Canadian Field Ambulance which then took over the whole responsibility for holding minor sick in the area. This left No. 4 free for normal operational deployment and on 29 April it moved to Nieuw-Milligen and established a medical inspection room and casualty collecting post evacuating to the advanced dressing station of No. 9 still located north-east of Barneveld.

On 28 April what amounted to a truce came into effect on the 1st Canadian Corps front. From this time until the end of hostilities on 8 May the 1st Canadian Infantry Division was employed mainly in containing the German units in western Holland, and during this period there were no further changes in the location of its medical units. The 5th Canadian Armoured Division had in the meantime been instructed to assist in the clearing of north-east Holland; its particular assignment was to clear out the enemy in and around Delfzijl. This task it completed by 2 May. The medical units of the division, No. 7 Canadian Light Field Ambulance and No. 24 Canadian Field Ambulance, opened respectively at Groningen on 22 April and at Ten Boer on the 26th. Battle casualties for the first few days of operation were comparatively few and were taken to No. 13 Canadian Field Dressing

Station now at Beilen where Groups I and II casualties were retained at the advanced surgical centre, Group III being passed on to No. 6 Canadian General Hospital at Ootmarsum.

CORPS AND ARMY MEDICAL ARRANGEMENTS

The rapidity of the Canadian advance, once the initial resistance north of the Nijmegen salient had been broken down, had called for a reorganization of the forward evacuation system and on 24 April a new medical operation instruction was issued by the D.D.M.S., First Canadian Army. In preparation some units had already been moved.

In the 1st Canadian Corps area No. 5 Canadian Casualty Clearing Station had opened on 23 April in Harskamp, three miles north of Otterloo. Corps casualties continued to be evacuated to the Nijmegen group of hospitals through No. 5, the Corps casualty clearing station. In the 2nd Canadian Corps area No. 3 Canadian Casualty Clearing Station opened on 23 April at Borger, a few miles north of Sgel, and No. 88 British General Hospital had moved to Cloppenburg, east of S gel. The 2nd Corps made greater use of air evacuation because of the distance between forward troops and the Nijmegen hospital group.

All casualties coming into the Nijmegen group of hospitals were directed from the ambulance control post at No. 3 Canadian General Hospital. Evacuation beyond Nijmegen was in the hands of the A.D.M.S. for No. 4 Lines of Communication Sub Area. The appointment of an evacuation officer in Nijmegen had resulted in better co-ordination of air and rail evacuation from that city and assisted in keeping army medical units cleared of evacuable casualties. The policy of keeping army casualty clearing stations and hospitals clear of all casualties except those unfit to be moved was thus retained, while cases expected to recover within 42 days were held at the base hospitals in Holland and Belgium.

NORTH-WEST GERMANY

The 2nd and 3rd Canadian Infantry Divisions, relieved by the 5th Armoured in North-Eastern Holland on 21 April, were now released for fighting in Germany itself. Taking up a position on the left of the Polish Armoured Division, the 3rd Canadian Infantry Division relieved the Poles of all responsibility west of the River Ems, and, moving across the river, prepared to take Leer, Aurich, and Emden. The 2nd Division meanwhile prepared to relieve pressure on the flank of the Second British Army farther east.

The attack on Leer, begun on 28 April by the 3rd Division, required an assault crossing of the Leda river. In order that casualties might be returned as quickly as possible No. 23 Canadian Field Ambulance opened a casualty embarkation and disembarkation post on either side of the river to evacuate

from the casualty collecting posts operating with the infantry brigades. All casualties were taken from the disembarkation post to the advanced dressing station of No. 22 Canadian Field Ambulance which evacuated seriously wounded to No. 2 Canadian Casualty Clearing Station at Meppen. By 1 May, Leer was cleared of the enemy and it was possible for No. 23 Canadian Field Ambulance to establish an advanced dressing station in the town high school from which it evacuated casualties from the whole division.

On 3 May No. 22 Canadian Field Ambulance had moved forward to Bagband, 10 miles north-east of Leer, as the 3rd Division prepared its attack on Aurich. No. 14 Canadian Field Ambulance, meanwhile, had also moved to Leer while No. 7 Canadian Field Dressing Station, still caring for divisional recovery cases, was located at Aschendorf. 5 May dawned clear and warm. At 8 a.m. the "cease-fire" on the 21st Army Group front went into effect. For the 3rd Division, the first Canadian division to land in North-West Europe, the long drive had ended.

The task of the 2nd Division was to come in on the northern flank of the Second British Army thereby relieving the British flanking formations for the attack on Bremen and at the same time forming the northern jaw of a pincer aimed at that city. It was also directed to take the important city of Oldenburg. The Division began moving to the new area by brigade groups on 18 April, and casualties en route were collected at a light advanced dressing station of No. 18 Canadian Field Ambulance at Herzlake and evacuated to No. 2 Canadian Casualty Clearing Station at Meppen.

By 21 April the take-over from the flanking units of General Dempsey's Second British Army was completed and the necessary medical arrangements had been made for the 2nd Division. No. 11 Canadian Field Ambulance opened an advanced dressing station in Cloppenburg on 19 April. On 21 April No. 4 Canadian Field Dressing Station opened a divisional recovery centre just west of Ahlhorn. On the same day No. 18 Canadian Field Ambulance opened an advanced dressing station just north of the same town, whereupon No. 11 Canadian Field Ambulance closed in Cloppenburg. Initial opposition to the advance of the Division was light and casualties were, in the main, caused by mines and booby traps left behind by the retreating enemy.

By the 23rd, the Division was in control of Kirchatten on the road south of Oldenburg. Field ambulance advanced dressing stations were opened successively as the advance warranted, the rear ambulance closing in preparation for a move through the forward one. Casualty evacuation was eased on 25 April when No. 88 British General Hospital opened in Cloppenburg, cutting the evacuation route by about 30 miles. A further shortening of evacuation time for the seriously wounded was effected on the following day when No. 21 Canadian Field Dressing Station opened an advanced surgical centre near No. 4 Canadian Field Dressing Station now in Delmenhorst.

On 28 April the drive towards Oldenburg had begun to make progress in the face of severe resistance. No. 10 Canadian Field Ambulance opened an advanced dressing station in Kirchatten and on the following day Nos. 11 and 18 Canadian Field Ambulances opened in Falkenburg. On the morning of 3 May No. 10 Canadian Field Ambulance, which had moved up into the Oldenburg Forest on the previous day, opened its advanced dressing station in the southern part of Oldenburg. The remainder of the town fell on the same afternoon whereupon the advanced dressing station was moved into the heart of the city while the other two ambulance units, Nos. 11 and 18, opened north of the city in preparation for the drive towards the sea.

During the engagement, from 21 April to 4 May, medical units of the Division were not hard pressed, although the length of the evacuation route and the condition of the roads, under almost ceaseless rain, made their task difficult. The worst day for the Division was 26 April when 127 casualties were evacuated from the thrust from Delmenhorst towards Oldenburg. Total divisional casualties evacuated during the period 21 April - 4 May were 925, of which 235 were due to enemy action.

The 2nd Canadian Infantry Division's attack on Oldenburg had been aided by the advance of the 4th Canadian Armoured Division on its left which, after capturing Bad Zwischenahn on 1 May, was directed on Varel, a point almost directly north of Oldenburg. The advance began on 2 May and by noon of the following day forward troops of the formation had made contact with those of the 2nd Division. After the slogging of the past two weeks the advance of 12 miles in a single day brought elation to the men of the 4th Armoured Division. When the cease fire order came its units were on the road outside Varel ready to push on to the town OB the following day.

THE GENERAL HOSPITALS, MARCH 1945-1946

During the last two weeks of March 1945 three hospitals from Italy were added to the Canadian medical establishment in North-West Europe. No. 5 Canadian General Hospital, which had arrived at Turnhout on 25 March, took over the patients of No. 16 at Oost Dunkirk during the opening days of April. Here it acted as a base hospital receiving casualties from the hospitals in the Nijmegen area and evacuating to a convalescent depot. The number of admissions was never very great, reaching a maximum of 118 on 1 May and dwindling rapidly thereafter so that the hospital was able to evacuate all but two cases by 30 May. On 12 September the hospital was disbanded at Turnhout.

No. 1 Canadian General Hospital also arrived from Italy at the end of March and was open for the last two days of the month at Nijmegen. Here it acted as an advanced hospital having a mobile neurosurgical and maxillo-facial team of surgeons attached. Evacuation was by air from the nearby Kluis airfield, and it was expected that the hospital would be able to hold

up to 50 per cent of its capacity in casualties expected to recover within 21 days. Air evacuation was particularly successful during the first few weeks of April and assisted the hospital in clearing its many casualties. At times up to 245 battle casualties, many recently wounded, were received in one day, but the evacuation of 200 or more daily by air helped to keep the hospital from becoming overcrowded. After 17 April the number of battle casualties dropped rapidly as the fighting moved into Northern Holland and Germany. After the beginning of May as other hospitals were closed in preparation for disbandment, the number of sick and injured in the Nijmegen area kept the hospital busy for several months. By December 1945 No. 1 was the only Canadian general hospital left under command of Canadian forces in the Netherlands, and on 18 January 1946 it was disbanded, having turned over its patients to No. 32 British Field Dressing Station.

No. 3 Canadian General Hospital, a 200-bed unit, relieved No. 88 British General Hospital at Tilburg on 15 March 1945. On 5 April it moved up to Marienboom, near Nijmegen, where 217 beds were set up. On 8 April battle casualties from across the Rhine began to arrive and a field surgical unit was attached to the hospital. For the next two weeks the hospital was busy admitting up to 122 casualties a day and carrying out 40 to 50 operations each day. After 20 April the intake of battle casualties ceased, and on 9 May the hospital moved to Apeldoorn where it remained until disbanded on 17 July.

Among the 600-bed hospitals in North-West Europe, No. 8 was disbanded in May 1945, but Nos. 7 and 16 were included in the Occupation Force and remained in Europe until 1946.

No. 16, which moved to Sögel, Germany, in April 1945 acted as a hospital for the treatment of liberated civilian and military prisoners of war from German concentration and military camps. During June 1945, it treated 15,000 released prisoners, of which 12,770 were Russian, 1989 Poles, and the remainder representatives of seven other nationalities. When this task was completed in August the hospital moved to Oldenburg where it was reduced to a 200-bed unit and served personnel of the 3rd Canadian Infantry Division of the Canadian Occupation Force. On 28 March 1946 it left Germany for England where the unit was disbanded.

When it was decided that No. 7 Canadian General Hospital should also form part of the Canadian Occupation Force it moved on 1 May from Turnhout, Belgium, to Bassum, Germany, where it admitted 1236 patients; this number included 556 civilians released from concentration camps in the area and liberated military personnel from eight European countries. Most of those admitted from the concentration camps were suffering from severe malnutrition and there were 31 deaths among the group; it was found that 35 per cent of the civilian patients were infected with tuberculosis. On 25 May the hospital closed and handed over its patients to No. 8 British General Hospital. In June it moved up to Hahn opening on the 20th of the month.

The accommodation at Hahn was not entirely satisfactory and on 3 July a further move was made to Sanderbusch where the unit operated as a garrison hospital receiving Canadian and other forces in the area until it closed on 23 May 1946.

RESUME OF MEDICAL ACTIVITY

During the last five months of the European campaign Canadian casualties were considerably fewer than they had been during the invasion period and the battles of Normandy and the Scheldt. There were, for example, 3271 fatalities during the period 1 January to 31 May 1945 and this includes 2976 who were killed in action or died of wounds. The total wounded during the same period was 9973. This is in striking comparison with the number from 6 June to 31 December 1944 when there were in North-West Europe 8140 fatalities including 7753 killed in action or died of wounds; the total wounded for this period was 23,355.

Sickness during the winter months was slightly greater, hospital admissions for causes other than enemy action were as follows:

| <i>1944</i> | <i>1945</i> |
|-----------------|----------------|
| June | January |
| July..... | February |
| August..... | March |
| September | April |
| October | May |
| November | |
| December | |

From these figures it may be gathered that major medical installations of the Canadian Army treated 83,943 Canadians. This figure does not include Canadian personnel treated in unit lines or divisional recovery centres and returned to duty within a short period of time, nor does it take account of the fact that as Canadian and allied forces were working in close co-operation a large number (21,494 for 1 January - 31 March 1945) of allied personnel also found their way into Canadian medical installations. From the quarterly reports of the D.D.M.S., First Canadian Army, it may be estimated that well over 60,000 allied personnel were treated by Canadian medical personnel in North-West Europe. It would appear, then, that during the North-West Europe campaign the Royal Canadian Army Medical Corps in the theatre had to deal with approximately 150,000 cases.

THE OCCUPATION

With the announcement of the German surrender on 8 May Operation "Overlord" came to an end. Three hundred and thirty three days had been required for its successful completion. From the beginning the objective,

* Figures for part of March and all of April and May include 1st Canadian Corps.

the defeat of the German military machine, had been kept in view; but as early as 1942, long before the invasion plan was firm, considerable thought had been given to the problem of civil affairs and military government in the areas to be conquered or liberated by the allied armies. A skeleton organization for the solution of the problem of civil affairs was soon functioning and it decided that civil health and hygiene would be the responsibility of the Civil Affairs, Relief Section, and that this section should seek the advice and assistance of army medical personnel where in adequate civil health and hygiene might adversely affect military operations.

Some experience was gained in the solution of problems of military government during the liberation of France and Belgium where the medical situation presented one of the most difficult problems to solve. The terrific destruction wrought by battles around thickly populated areas such as Caen inflicted heavy casualties on the civilian population, whose suffering was further aggravated by a shortage of medical supplies and trained medical personnel. In the most severe and urgent cases the shortage of supplies was at least partially remedied from Civil Affairs and Royal Canadian Army Medical Corps stocks and, as they were uncovered, enemy supplies were frequently handed over to the civilian authorities.

The value of the experience gained in the early stages of the campaign is apparent in the planning which was done for the occupation of Germany at its conclusion. In France, Belgium, and Holland the civil population, if disorganized, was at least co-operative. In Germany it was expected that in addition to the large numbers of defeated troops to be dealt with there would also be the problem of a deliberately unco-operative civil population.

Operation "Eclipse" was designed to take care of the situation in Germany as the country was conquered piecemeal or after it had capitulated. No repetition of the post-war experience of 1918 was desired, as the following extracts from the 21st Army Group directive show:

Operation "Eclipse" is designed to ensure that once and for all no possible shadow of doubt shall be left in the mind of a single German that the military might of the Third Reich has been shattered. . . .

If the defeat of the German armed might has required years of "blood, tears and sweat" on the part of all the Allies, the problems which have to be faced in Operation "Eclipse" are in no way less formidable. To eliminate Nazism and German militarism to disarm, control and disband all German naval, military, air force and para-military formations; to enforce the terms of surrender and to restore law and order in a country bred on the fantastic conception of a master race and imbued with an unreasoning reverence for military power, will neither be a pleasant nor an easy task and will require the continuous vigilance, energy and determination of all concerned. . . .*

Within the general plan of "Eclipse" the First Canadian Army had certain tasks to perform, some connected with, some outside, the operation itself.

General Crerar in his report to the Minister of National Defence gave some indication of the broad series of problems with which he had to deal.

* 21st Army Group Pamphlet "Operation Eclipse", Pamphlet 1.

During this time (he wrote), I was faced with problems differing in their nature and complexity from those with which I had been mainly preoccupied while the battle was still engaged.

I was called upon to disarm and demobilize the considerable enemy forces which came under my control, a task involving the movement of 140,000 Germans of the defeated Twenty-Fifth Army out of the western Netherlands back to their own country. At the same time it was my responsibility to restore civil administration in the newly liberated territory and to establish Military Government in that part of North-Western Germany which had been overrun during the course of the army operations. No less important were the tasks of forming the Canadian Army Occupation Force, providing for the early return of volunteers for the Canadian Army Pacific Force and long-service personnel to Canada and gradually disbanding the First Canadian Army and arranging for the repatriation of its divisions. . . .*

Because of the nature of the fighting in the last two weeks of the campaign, numerous German hospitals and prisoner-of-war camps had been overrun both in Holland and Germany, and as a result of this the Royal Canadian Army Medical Corps was involved in "Eclipse" activities long before the cessation of hostilities. It was already preparing to undertake its "Eclipse" tasks before the final triumphant drive got under way.

CANADIAN MEDICAL PLAN FOR "ECLIPSE"

Plans for the Canadian medical organization within Operation "Eclipse" began to take shape in March 1945 with the appointment of an A.D.M.S. for the operation. It was realized from the beginning that the organization must be highly flexible and make full use of existing medical facilities if it were to render the best service under conditions the nature of which could only be forecast in the most general terms. On this basis an outline plan was drawn up to take care of specific operations. The major tasks of the medical services were :

- (a) Medical care of British and Allied Forces under 21st Army Group.
- (b) Medical care of United Nations prisoners of war and British/U.S. internees and evacuation of the sick and wounded.
- (c) Supervision and control of the Medical Administration of the German Army, paramilitary organizations and other elements of the German Armed Forces not controlled by the Royal Navy and Royal Air Force.
- (d) Seizure and control of all medical stores, equipment and property (including hospitals) of the Medical Services of the German Armed Forces (less that required by and under control of the RN and the R.A.F.).
- (e) Maintenance of close liaison with the Public Health Section of Military Government branch over joint problems affecting military and civil requirements.†

The task of the medical services in all stages of training and operations is a continuing one. Care of the regular troops proceeded normally while special arrangements had to be made so that the main task would not be prejudiced by the others; for it must be borne in mind that the capture of many German

* Operations First Canadian Army—Crerar Report, 1 August 1945.

† W.D., D.D.M.S., 1 Cdn Army, March 1945, Appx 3.

prisoner-of-war camps and hospitals occurred while the Canadian Army was engaged in heavy military operations in North-West Germany and Holland.

The D.D.M.S., First Canadian Army, was ultimately responsible for all medical matters within the Army boundaries, using, of course, Corps and Divisional medical resources as well as those of the military government found in prisoner-of-war camps and German medical resources and personnel. The A.D.M.S. for "Eclipse", on the other hand, was to help with the special problems arising out of the occupation of enemy territory. One of the first medical problems to be dealt with was the provision of attention for liberated prisoners of war in camps which had been overrun prior to the cessation of hostilities. Medical conditions in these camps were very bad because of overcrowding and inadequate arrangements for care of the sick. In the earliest stages of the advance medical sections or companies were detached from divisional field ambulances and dressing stations to supervise the care of the sick while hygiene sections went to work on living conditions in the camps. By 6 May this arrangement was vastly improved as No. 16 Canadian General Hospital was moved to Sögel where it opened on 10 May to care for sick allied ex-prisoners of war.

Fit personnel of British, Canadian, or American forces were evacuated to a transit camp in Nijmegen where medical inspection was carried out by a medical officer from Army Troops area. Other allied prisoners of war were gradually moved into the better camps while awaiting repatriation to their own countries.

Up to 1 May, 26 German military hospitals had been overrun. These units were generally well housed, adequately staffed and had ample medical supplies in contrast to the prisoner-of-war camps. There were few British, Canadian, or American prisoners of war in these hospitals and these were all evacuated as rapidly as possible through allied medical channels. The great majority of the patients in German hospitals were German sick and wounded, with a sprinkling of Dutch, Poles, Russians, Italians, and others. The evacuable Germans from these hospitals were soon concentrated into hospitals in six major cities and the allied casualties grouped according to nationality while steps were taken for their repatriation. At the same time the concentration of captured German medical equipment in dumps for sorting and disposition was begun.

Provision of adequate German staffs for enemy prisoner-of-war hospitals presented no problem, although adequate supervision of these by Canadian medical personnel placed some strain on divisional and corps medical resources.

During the last week in May evacuation of German casualties from Holland to Germany began and up to 2000 per week were moved out of Dutch territory. By 1 July there were only five German patients left in the Canadian area of Holland and these were transferred to No. 6 Canadian

General Hospital at Zuidlaren. One German 50-bed hospital was retained at Bloemendaal, Holland, to care for German prisoners of war engaged in removing mines and other demolition work.

During the first week after the capitulation of the German forces in the 21st Army Group area Canadian divisions remained in the locations which they occupied at the cessation of hostilities. Fighting formations were engaged in rounding up the defeated enemy into concentration areas while medical personnel continued the task of caring for their own troops as well as evacuating liberated prisoners of war from captured medical installations, supervising captured German hospitals, and making inventories of their medical stores and equipment.

The 2nd Canadian Infantry Division operated in the territory surrounding Oldenburg, with the 4th Canadian Armoured Division on its left at Bad Zwischenahn and the 3rd Canadian Infantry Division farther to the north-west near Aurich. By 13 May the 2nd Division had concentrated all German prisoner-of-war casualties in one hospital at Oldenburg and "the divisional area was all tidied up and well in hand". It then began to take charge of the areas occupied by the 3rd and 4th Canadian Divisions.

Following the take-over from other divisions in the area the 2nd Canadian Division gradually began to assume the responsibilities of the 2nd Canadian Corps in the entire Corps area. This included the supervision of 9000 German hospital beds by 22 May. On 29 May the advance party of the Twenty-Fifth German Army arrived from Holland. The Germans, under supervision, were responsible for the care of their own troops on the line of march from Holland to Germany and for the care of their own prisoner-of-war casualties being transferred to Germany.

The march-in of the German army began at the end of May and the 2nd Division area received between 5000 and 10,000 fit each day. In addition, there were about 150 casualties per day arriving back in this part of Germany. Those likely to recover within a reasonable time were retained on the mainland while hospitals in the Frisian Islands were used as convalescent hospitals for long-term convalescents and amputation cases. Direction and co-ordination of the movement, which was completed by the end of June, was by Canadian medical officers stationed at staging points along the various routes used. By the end of June the 2nd Division, which had now come under control of the 30th British Corps, had supervision of 31 German hospitals, plus six trains used as hospitals, with 18,000 beds and 13,000 patients.

On 11 July the 2nd Division turned over its responsibilities to the reconstituted 3rd Canadian Infantry Division, Canadian Army Occupation Force, and moved into Holland. All medical units of the Division moved into the Utrecht area by 12 July. During August No. 11 Canadian Field Ambulance was disbanded, personnel being posted to vacancies in other medical establishments and on 18 September the movement of the Division to Canada commenced. No. 18 Canadian Field Ambulance closed for the last time on

26 September, and by the end of the month the 2nd Canadian Infantry Division medical units were all in process of turning in equipment as they prepared to depart for home. The final entry in the war diary of the A.D.M.S., 2nd Canadian Infantry Division, appears on 12 October 1945.

A warm bright sunny day. Divisional HQ closed at noon. All vehicles and equipment were turned in. There were a few personnel to leave on draft on 13 and 14 Oct., but all arrangements were made. The war for 2nd Cdn Inf Div, is over. . . .

It had been decided that the 3rd Canadian Infantry Division would be Canada's contribution to the occupation force and after its move back into Holland in mid-May a second organization known as 3rd Canadian Infantry Division, Canadian Army Occupation Force, was built up alongside the original division. Volunteers, men with low priority scores, and reinforcements from the United Kingdom were used to build this reconstituted 3rd Canadian Infantry Division while the old timers were gradually released for repatriation. For some time, therefore, there were two Assistant Directors of Medical Services working side by side to reorganize the medical establishment of the parallel divisions. While the new brigades were being equipped and brought up to strength the field ambulances took care of evacuation of sick, operating sick bays to hold short-term casualties.

With the departure of the 3rd Canadian Infantry Division, Canadian Army Occupation Force, for Germany on 8 July the medical problem was eased, and on 14 August No. 23 Canadian Field Ambulance disbanded. By 19 October No. 14 Canadian Field Ambulance was the only divisional medical unit remaining for the care of the troops, and on 17 November it too turned in its equipment and left for Canada. The old 3rd Division had been the first Canadian division in Normandy, it had fought through to the end of the war and had now ceased to exist, but it was leaving behind the new 3rd Division to help hold the once proud fortress of Europe until the Canadian Occupation Forces were withdrawn.

Tasks similar to those of the 2nd and 3rd Canadian Infantry Divisions were undertaken in the Bad Zwischenahn area by 4th Canadian Armoured Division which found itself concentrated in that area when the fighting stopped. On 26 May it handed over to the 2nd Canadian Infantry Division and moved back to a site near Almelo, Holland, where one section of No. 12 Canadian Light Field Ambulance supervised a staging camp at Denekamp for wounded Germans being returned to Germany. On 18 June the Division took over No. 17 Canadian Light Field Ambulance from the 1st Canadian Armoured Brigade and disbanded it on 18 August.

When the Division moved back to Amersfoort in September its other medical units were already shrinking as personnel with high priorities left for Canada and those with low priorities joined the 3rd Canadian Infantry Division, Canadian Army Occupation Force. By mid-December the medical commitment had almost ceased to exist, and by the end of the month another Canadian division with a proud fighting record had been disbanded.

The cessation of hostilities found the 1st Canadian Infantry Division poised for a drive towards Utrecht in Western Holland. While the Division was never called upon to put in this final attack it was required to advance over the same territory to ensure that stragglers from the Twenty-Fifth German Army were rounded up and concentrated in the five selected main camp areas. During this phase a number of German military hospitals and prisoner-of-war camps were again uncovered. Their number was less than in the Oldenburg area of Germany, and it was not long before all patients had been screened, allied casualties being evacuated and German patients and staff concentrated in three large hospitals.

The next task facing the 1st Canadian Infantry Division was that of getting the Germans back to Germany. All German army personnel were examined by their own medical service under Canadian supervision and those fit to march were soon started on their way back to Germany. Staging camps were established and each group of marchers was accompanied by a German medical officer while ambulances were provided for the evacuation of marchers who fell out along the route. By 7 June all fit German troops had been moved out of Holland and a beginning had been made in disposing of hospital patients and non-marchers.

Because there was no necessity of further occupation all divisional commitments were turned over to the Netherlands authorities on 26 June, and the 1st Canadian Infantry Division moved into concentration around Utrecht and began its own disbandment. During this phase each field ambulance evacuated its own brigade groups and no difficulties were experienced as casualties were few. On 25 August the men of the Division began moving from Utrecht to the repatriation centre at Nijmegen at the rate of 1000 per day, and by 15 September 1945 the 1st Canadian Infantry Division was no more. The last medical unit of the Division, No. 5 Canadian Field Ambulance, was disbanded on 8 September.

On 3 May 1945 a decision was made to disperse the 5th Canadian Armoured Division through the three northern provinces of Holland, Friesland, Groningen, and Drenthe, as soon as the German Army collapsed. The medical problem was again the evacuation of allied personnel from German hospitals and the supervision and concentration of German medical personnel and casualties. Fortunately the number of allied casualties in German hospitals was small, and the concentration of German patients into hospitals at Zuidlaren, Steenwijk, and Leeuwarden was undertaken at once. By VE day all patients and staffs of outlying German military hospitals were concentrated in these three establishments. On 28 May the first convoy of ambulances left Zuidlaren carrying German casualties to Aurich and by 15 June all except six seriously ill had been moved out. These six were taken over by No. 6 Canadian General Hospital at Zuidlaren.

The disbandment of medical units began on 30 June when No. 13 Canadian Field Dressing Station ceased to exist. Thereafter the Division's

medical service melted rapidly away as men of the Division were repatriated. On 5 December the A.D.M.S., 5th Canadian Armoured Division, wrote:

There was heavy snowfall throughout the day. This is the final entry in the war diary of HQ medicals of 5 Cdn Armd Div. . . .

With the cessation of hostilities and consequent rapid reduction in the number of casualties which were not able to be treated at divisional medical installations the need for many army medical units disappeared. Among the first to go were the British hospitals, Nos. 39 and 88, with their attached surgical and transfusion units, which had rendered signal service to the First Canadian Army since the Normandy operations. These units were returned to the British forces and with their departure, except for a British ambulance car company, only Canadian medical units remained with the First Canadian Army

By the end of June seven Canadian transfusion units, 11 field surgical units, two exhaustion units, and a field dressing station had been disbanded. On 26 June 2nd Canadian Corps turned over its medical units to First Canadian Army, a procedure followed by 1st Canadian Corps five days later.

At the end of July, First Canadian Army became known officially as Canadian Forces in the Netherlands. By mid-July all Canadian divisions had moved to their final concentration areas in North-West Europe and a review of the medical situation was made. As a general policy it was laid down that all medical units would be disbanded, none would return to Canada intact. It was decided that immediate reductions in medical services could be effected because the static role of the divisions would not make such demands on medical service, and it was felt that low priority personnel from disbanded medical units could be used to maintain the efficiency of the remainder. In any case it was evident that the medical commitment would rapidly be reduced when large drafts began to move out of the theatre as repatriation got under way.

By 7 September Canadian Forces in the Netherlands had under command two general hospitals, six casualty clearing stations, two field dressing stations, six field hygiene sections, three venereal disease treatment units, an advanced depot medical stores, two mobile bacteriological laboratories, and a mobile hygiene laboratory together with eight prophylactic ablution centres. *

MEDICAL UNITS WITH THE CANADIAN ARMY OCCUPATION FORCE

In December 1944 the Canadian Government had decided that Canada should contribute one division, about 25,000 men, to the forces which were

* This, of course, does not include divisional medical units or units with the Canadian Army Occupation Force.

to occupy Germany at the conclusion of the war. This force was known as the 3rd Canadian Infantry Division, Canadian Army Occupation Force. It was made up of the normal divisional components required to provide a self-administering unit.

By 11 July 1945 the newly constituted Division was organized and had taken over its duties in Germany. As finally constituted, its medical components were: five field dressing stations, of which one was British, one field hygiene section, 18 regimental medical officers, provided from among volunteers or those with a low repatriation priority, two Canadian general hospitals of 600 beds each, and one company of a motor ambulance convoy.

Each regimental medical officer operated a sick bay of 10 beds, holding sick and injured who were expected to recover within 48 hours. Field dressing stations had each 40 beds and held patients up to 14 days. General hospitals held cases likely to recover within six weeks, discharging patients to the 3rd Canadian Infantry Division reception centre or directly to the soldier's previous unit.

During November a new hospital war establishment for Nos. 7 and 16 Canadian General Hospitals was approved. No. 16 became a 200-bed hospital and No. 7 a 600-bed hospital with a 100-bed increment, providing a total of 1213 beds for the Division. Thus the 3rd Canadian Infantry Division (C.A.O.F.) was a relatively self-sufficient formation medically. Its medical facilities were also made available to R.N. and R.A.F. personnel in its area.

When it took over the Oldenburg area in July there were about 14,000 German casualties hospitalized in the area. These were steadily reduced as the casualties were discharged on recovery, but even in December 1945 there were still in the area some 90,000 fit Wehrmacht personnel whose medical arrangements had to be supervised by the Canadian medical staff.

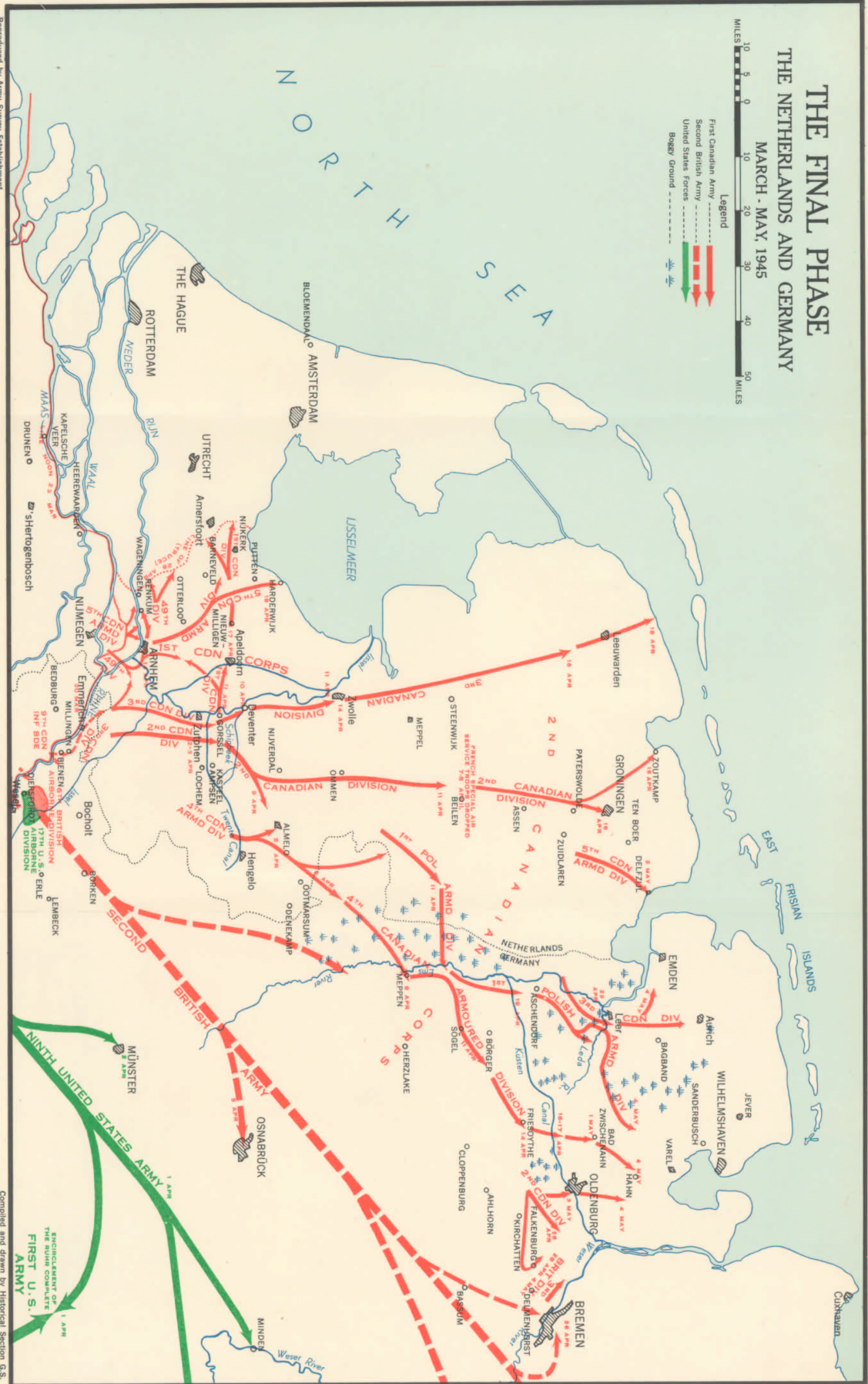
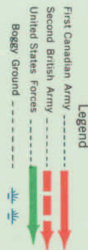
The G.O.C., 3rd Canadian Infantry Division (C.A.O.F.), was also military governor of the area and the A.D.M.S. was his medical adviser in this aspect of his work. Thus the divisional medical services acting in an occupational role had superimposed on their normal functions the problem of dealing with large numbers of enemy convalescents together with the staffs of the German hospitals, of supervising the medical services of the German army personnel concentrated in the area during their period of demobilization, and the general problem of assisting in the restoration of normal health and hygiene conditions among the civilian population in the occupied area.

In December 1945 the Canadian Government decided that Canadian troops would be withdrawn from the occupation force beginning in April 1946, and preparations were begun for handing over Canadian commitments to the 52nd (Lowland) Division. On 20 March 1946 the first field dressing station moved out to the transit camp at Delmenhorst and began its move to the United Kingdom. By 15 May all medical units had been closed and

THE FINAL PHASE THE NETHERLANDS AND GERMANY

MARCH - MAY, 1945

MILES 10 20 30 40 50



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were on their way out of the country. The 52nd Division then took over from 3rd Canadian Infantry Division (C.A.O.F.) and the Canadian Army Occupation Force ceased to exist.

Six years and nine months after Canada had declared war, and almost two years after the opening of "Overlord", the last Canadian troops withdrew from the soil of Germany.

HONG KONG

When Canadian forces left Vancouver for Hong Kong on 27 October 1941, four Canadian medical officers, two nursing sisters, two dental officers, and a number of other ranks accompanied them. The majority of the force sailed on the S.S. *Awatea*, and a small overflow on the escort vessel H.M.C.S. *Prince Robert*. The usual shipboard activities occupied their attention; an unusual event of the voyage was the death of an unrevealed diabetic from insulin hypoglycaemia resulting from his continuing to take insulin secretly while being seasick.

On arrival at Hong Kong the medical set-up was found to be that of a normal British command with two military hospitals and one naval hospital. Two medical officers and two nursing sisters were posted to the British Military Hospital at Bowen Road; the other two medical officers remained with their respective battalions at Sham Shui Po Camp on the Kowloon peninsula where the bulk of the Canadian forces were quartered. The A.D.M.S. readily agreed to have separate records maintained for Canadians admitted to the British hospitals.

The only serious medical difficulty encountered up to the eve of the Japanese attack was the incidence of venereal disease which had become a very definite problem by the first week in December, threatening to impair the fighting efficiency of the force.

British medical plans in the event of an attack on Hong Kong involved a considerable expansion of existing facilities. A convent and a hotel were to be taken over and equipped as annexes to the Bowen Road Military Hospital. St. Stephen's College on Stanley Peninsula at the southern end of the island was also to be turned into a military hospital. Including the Combined Military Hospital in Kowloon there would thus be five hospitals available for military patients exclusive of the naval hospital and the several civilian ones.

The senior Canadian medical officer was posted to the Hong Kong Field Ambulance as second-in-command. Two other Canadian medical officers were also posted to the Ambulance. The remaining medical officer was to be left free to keep track of Canadian hospitalizations. The two nursing sisters were to remain at Bowen Road. All other rank personnel, who were to act as regimental stretcher bearers, went through an extensive training period to acclimatize themselves to innovations recently introduced to the casualty evacuation scheme in Hong Kong.

At approximately 8 a.m. on 8 December the Japanese opened their attack on the Colony by bombing various targets on the Kowloon peninsula. The garrison had been ordered to its battle stations on the previous day.

One Canadian medical officer was directed to the Royal Rifles of Canada at Tai Tam Gap, and another to "C" Company of the Winnipeg Grenadiers at Aberdeen Reservoirs. The fourth medical officer and the two nursing sisters had been instructed to remain where they were at Bowen Road Hospital.

No R.C.A.M.C. personnel and only a very small portion of the Canadians became directly involved in the fighting on the mainland. During the first bombing of Kowloon the personnel of the medical inspection room at Sham Shui Po Camp transferred their equipment and medical supplies to Wan Chai Gap, the island headquarters of the Grenadiers. Casualties from the mainland were evacuated to the Combined Military Hospital in Kowloon and later removed to St. Albert's Convent on the island. Thereafter, until the final withdrawal was completed on 13 December, casualties from the mainland were evacuated to Bowen Road Hospital.

From this day onward the whole medical situation became increasingly difficult. Once the Japanese were free to devote their full attention to the island, ambulance cars with their prominent red crosses became a favourite target especially of aircraft and it became necessary to restrict movement to darkness, at which time shell holes and bomb craters were an even greater hazard than in the daytime.

During the night of 18-19 December the Japanese effected a landing on the north-east part of the island. By morning the building occupied by one Canadian medical officer on the outskirts of Sau Ki Wan had been overrun. His own small staff was killed. After receiving some barbarous treatment from his captors, this officer was eventually spared.

Medical arrangements as a whole were soon badly disrupted. During 19 December the Japanese forced the troops defending the eastern portion of the island to withdraw southward towards the Stanley Peninsula, and by the end of the day the island had been effectively cut in two. In the western part of the island a co-ordinated system of evacuation was kept functioning a day or so longer, but it became increasingly difficult and finally impossible for ambulance cars or other vehicles to move. In the few days remaining until the final capitulation on 25 December, wounded in the contracting western defence area were transported to either of two civilian hospitals which had been pressed into service for military patients, or to Bowen Road Hospital by whatever means their comrades could devise.

With the formal surrender of Hong Kong there began for the survivors among the garrison a long period of dreary captivity amid conditions that are almost indescribable. For nearly four years they were herded together like cattle in various prison camps, kept on a near-starvation diet, and compelled to perform hard manual labour for their captors. The odd individual excepted, the Japanese were in Canadian experience largely indifferent to the requirements of the sick among their prisoners, and the medical facilities that they provided of their own volition were hopelessly inadequate.

It is questionable whether many Canadians would have survived this grueling experience without the care and attention provided by their own medical officers, who by various stratagems managed to obtain the wherewithal to carry on an active practice.

The Canadian prisoners were in the first instance dispersed among three camps. By the end of December the senior Canadian medical officer and two other medical officers found themselves back at Sham Shui Po, with some personnel of Brigade Headquarters and what was left of the Grenadiers. The remaining medical officer was interned in a former camp for Chinese refugees on Argyle Street, Kowloon. With him were about 70 other Canadians and a considerable number of British and Indian troops. The remnants of the Rifles and additional survivors from Brigade Headquarters had been collected at North Point, also a former Chinese refugee camp. This arrangement lasted until almost the end of January 1942 when all Canadians were concentrated in the North Point Camp. Those Canadians who had been unable to walk to prison camps following the surrender were collected at Bowen Road Hospital.

Many hardships were encountered at Sham Shui Po Camp. Little was left of any building except four walls and the roof. Into this camp which originally housed two battalions, the Japanese had jammed almost 6000 troops, Canadians, British, Indians, and Hong Kong Defence Corps Volunteers. Feeding alone was a serious problem. The Japanese provided rice, a small amount of meat, a few vegetables, and firewood, but cooking utensils had to be improvised. A dysentery epidemic soon complicated matters. A billiard table was used to perform surgical work. Instruments had to be boiled in pots used for cooking. Chloroform served as the only anaesthetic and sulpha drugs as the principal antiseptic for wounds. The temperature dropped to 40 and 50 degrees at night with a strong wind prevailing. Men were without blankets and windows had to be stopped up with rags. Conditions at the Argyle Street Camp were scarcely better. At the end of January all Canadians were concentrated at North Point Camp where the situation improved gradually and liaison was permitted with Bowen Road Hospital.

About the middle of April all naval personnel were removed from North Point, leaving a purely Canadian camp. At the same time the Japanese began to pay officer prisoners, including three months back pay which permitted the purchasing of extra medical supplies. The sick rate continued to be high with a daily minimum of 140 and a maximum of 250 attending sick parade during one month. By June the Japanese were demanding work parties for heavy labour on the Kai Tak aerodrome. It was a problem to find enough fit men to fill the quota; their demands increased the rate of exhaustion cases. A diphtheria epidemic during August struck some 500 troops, killing 46. This epidemic was believed to have the long term result of saving lives in that many of these personnel were excused from heavy labour. Only

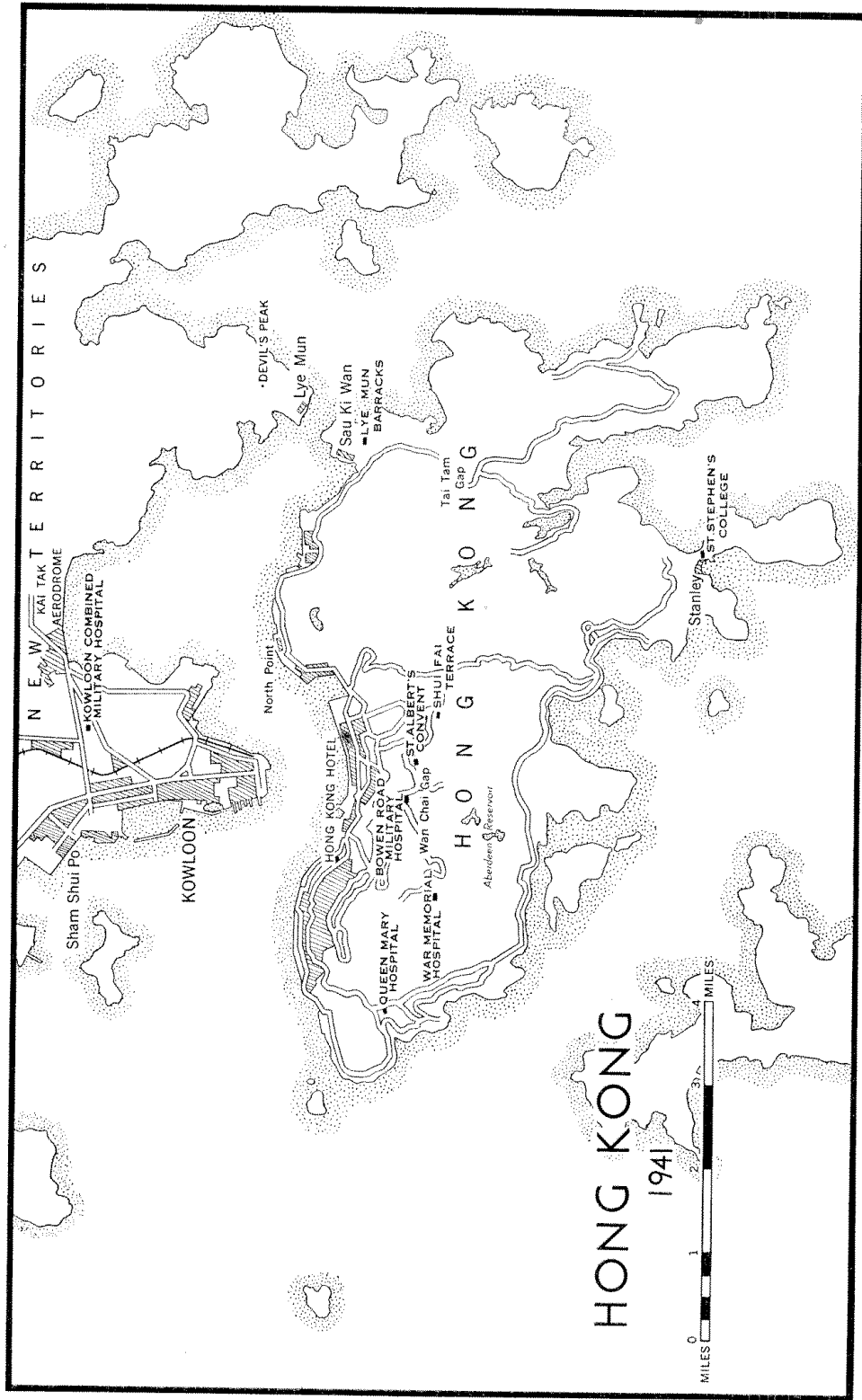
a very few Red Cross parcels, unfortunately, were allowed to reach our troops at Hong Kong.

In January 1943 about 650 Canadians were sent to Japan to work in ship-building and mining industries. Three later drafts brought the total of Canadians transferred to Japan to one medical officer and 1183 other ranks. The medical officer, chosen by lot to accompany the first work party to Japan, served as commanding as well as medical officer for a group of 500 since he was the only one holding commissioned rank. The measure of his success in extracting every possible concession from the Japanese, in making the fullest use of most inadequate medical facilities, and in persuading his fellow prisoners to make the best of things, is that only 25 of this particular group died. This, the largest group of Canadians in Japan, had the smallest number of deaths. Of the 684 Canadians confined elsewhere in Japan, 111 died of accident or disease. At Hong Kong deaths among prisoners totaled 128, excluding four shot without trial after attempting to escape.

Of the 1972* Canadian soldiers who reached Hong Kong, 1416 eventually returned to Canada. Fatal battle casualties, including died of wounds and prisoners killed by the Japanese, totalled 290. In the prison camps there were 250 deaths from disease, 11 from accident or injury, and 3 from unstated causes, a total of 264. Two Canadians died subsequent to their release, one in Japan, the other en route home. The number of deaths from disease indicates very clearly the hardships experienced.

The two nursing sisters who had been attached to Bowen Road hospital continued to work there with the rest of the group after the Japanese occupation. Despite the many hazards they were able to survive and to live through the period of imprisonment with the civilians in an internment camp on Stanley Peninsula. They were repatriated to Canada in November 1943. The account which they were able to bring with them carefully memorized, together with a preliminary casualty list, provided the first official information that was received in Canada about the fateful events which had involved the Canadian forces in Hong Kong.

* 1973 sailed from Vancouver; as previously noted, one died en route. (There were also two Auxiliary Services supervisors.)



Compiled and drawn by Historical Section, G.S.

ANCILLARY MEDICAL SERVICES FOR THE ARMY

NURSING SISTERS

The first record of a trained Canadian female nurse taking part in a military campaign is contained in a report by Surgeon-General D. Bergin on the suppression of the North-West Rebellion. On that occasion Nurse Miller was issued instructions "to proceed without delay to the front by the Moose Jaw trail". Nurse Miller arrived at Saskatoon on 12 May 1885, and immediately took charge of the wounded. She was later joined by Nurses Elking and Hamilton with an assistant and helper. Other trained nurses to take part in this campaign were four Sisters of the Order of St. John the Divine and three skilled nurses who joined the Moose Jaw Hospital on 30 May. Much praise was given these nurses by Surgeon-General Bergin.

The first intimation of a definite Nursing Service appeared in G.O. 62 of 1899 which stated that the "creation of a Canadian Army Nursing Service is in contemplation and will be organized at a future date". But before this "future date" came, trained nurses took part in the South African War. In November 1899, four Canadian nurses proceeded to South Africa to assist in the care of the sick and wounded of the Colonial Contingent and on 8 January 1900, Militia Order No. 5 authorized the appointment of four more nurses for similar duty. On 25 January 1900, Militia Order No. 20 set forth that these nurses "are accredited as Lieutenants" with the pay and allowance of that rank.

On 1 August 1901 the Nursing Service was organized as an integral part of the Army Medical Corps. When the Army Medical Service was reorganized in July 1904, an establishment was created in the non-permanent branch for nursing sisters in the relative rank of Lieutenant, and it was from this reserve in the autumn of 1906 that two nursing sisters — Miss G. Pope and Miss M. C. MacDonald — were appointed to the permanent corps and posted for duty to the military hospital at Halifax. The expansion of the nursing service prior to 1914 was very slow and at the outbreak of the First World War, there were only five nursing sisters in the Permanent Army Medical Corps and 57 on the Reserve List. Members of the Nursing Sister Reserve were chosen from civilian nurses of suitable qualifications; they had to undergo a one-month training course at a garrison hospital where they were instructed in the routine and ethics of army nursing. They had to pass an oral and written examination before their appointment to the C.A.M.C. was confirmed. The Reservists were sometimes called up for temporary duty at military hospitals.

Both the Permanent and Reserve Nursing Services were under the administration of the D.G.M.S., N.D.H.Q., and the rules and regulations were based upon those of Queen Alexandra's Imperial Military Nursing Service. In 1911 a P.A.M.C. nursing sister was sent to England to study the nursing system in British military hospitals.

Inter-War Years

The first step in the mobilization of the nursing service in the First World War was the appointment of a Matron-in-Chief. She took over the duties of A.M.D. 4 at National Defence Headquarters, and immediately made preparation for the enlistment of nursing sisters pending the receipt of mobilization orders. The instructions laid down for the Imperial Military Nursing Service were utilized whenever possible. The order to mobilize was received on 16 September 1914. No recruiting campaign was necessary for the nursing service and mobilization consisted of the selection of suitable candidates from a host of eager volunteers. In the first contingent there were 99 nurses under Matrons M.C. MacDonald and E. B. Ridley. From this nucleus the overseas nursing strength rose to a peak of 1886. Of this number, 21 were killed in action, six were wounded, and 17 died of disease while on active service.

Following the cessation of hostilities in 1918 most of the C.E.F. nursing sisters were demobilized to civilian life and many took employment with the Soldiers' Civil Re-establishment Commission. A small number remained in the Permanent Force and were posted to the various military hospitals across Canada. The actual numbers of the Permanent Force nurses varied from year to year but at the outbreak of the Second World War there was one matron and ten nursing sisters in the Permanent Force and 331 on the reserve list.

The administration of the nursing service during the inter-war years was largely in the hands of the D.G.M.S. as the nursing service had no representative at N.D.H.Q. The Matron on the peace-time establishment was employed at Halifax Military Hospital. That the future mobilization of the nursing service was not neglected was evidenced by the extensive work done on the National Enrolment Plan by the Canadian Nurses Association in co-operation with the Canadian Red Cross Society and with the approval of the D.G.M.S. This plan, dating back to 1927, envisaged the enrolment of all registered nurses who "would be known to be ready for emergency service in case of war or disaster".

The plan was approved in February 1927 and a National Joint Committee was formed consisting of a representative of the Canadian Nurses Association and the Canadian Red Cross Society. A similar committee was then set up in each province whose duties were to contact all nurses and encourage them to enrol. The contact was usually made at the time of renewal of annual membership.

In 1934 a classification of nurses was adopted as follows:

- Class A. Nurses enrolled for war and disaster.
- Class B. Nurses enrolled for war only.
- Class C. Nurses enrolled for disaster.
- Class D. A reserve including nurses over the age of 45 years.

The actual enrolment figure set at this time was 3000.

Mobilization - 1939

The mobilization of the nursing service was under district arrangement. At the outbreak of the war there was a general reserve list in each district from which the district medical officer selected suitable candidates. His selection was either from approved credentials or from personal interview and, with due respect to priority of application, he submitted through the District Officer Commanding the names of all candidates to N.D.H.Q. Here the D.G.M.S. on the advice of the Matron-in-Chief gave the final approval. On receipt of approval from N.D.H.Q. the district medical officer arranged for a medical examination by a three-man medical board and if the volunteer was found physically fit in accordance with *Physical Standards and Instructions* she was duly attested and appointed in the relative rank of second lieutenant. The qualification necessary for appointment in the nursing service was outlined in *King's Regulations and Orders (Canada)* as follows:

- (i) A British subject and physically fit for military service.
- (ii) Under forty-five years of age, unmarried or a widow without children.
- (iii) A nursing sister must be a graduate of a school of nursing accredited by the Canadian Nurses' Association and registered in a provincial Registered Nurses' Association.

In the selection of candidates little use was made of the National Enrolment list. That this list was not fully utilized was probably due to lack of co-operation between the district medical officers and the provincial joint committees and also to the fact that the reserve list and a flow of new applications proved an ample source of supply for army nurses. The Matron-in-Chief in February 1941 stated that the "List" was used very little in Prince Edward Island, Nova Scotia, and New Brunswick. In Ontario various matrons kept it in mind but it was not used at all in Manitoba. It was only used to a limited extent in Alberta and Saskatchewan. At this stage it was decided to strengthen the provincial committee and to encourage closer co-operation between that body and the district medical officers. The lack of initial success, although discouraging, did not deter the Canadian Nurses Association from urging the Joint Committee to continue their efforts.

The usefulness of the National Enrolment Plan as a means of facilitating mobilization is a debatable point in the light of the patriotic spirit shown by the nurses of Canada in both wars. If there was any shortage of nurses in

the armed forces it was not due to the lack of volunteers but rather to the unwillingness of the armed forces to deprive the civilian population of trained nursing personnel.

Following her appointment to the Canadian Active Service Force the nursing sister was required to take a two weeks qualifying course as ordered by the D.G.M.S. The course was held at a military hospital and was designed to give the newly appointed officer an insight into military hospital procedure and army nursing methods. Later this course was extended to include instruction common to all arms. The first nursing sisters mobilized were those required for two general hospitals and the permanent hospital installations throughout Canada and by 31 March 1940, a total of 159 nursing sisters had been enrolled.

In January 1940 Miss E. F. Pense, O.B.E., R.R.C., was appointed Matron in charge of A.M.D. 4, a sub-division of the D.G.M.S. directorate, but only remained in this post until April when she was posted to England as Matron-in-Chief, Canadian Military Headquarters. She was replaced in Ottawa by Miss E. L. Smellie, C.B.E., R.R.C., L.L.D., who assumed the duties of Matron-in-Chief for Canada.

With the appointment of Miss Pense as Matron-in-Chief, C.M.H.Q. in April 1940 began the build-up of the R.C.A.M.C. nursing service overseas to its peak strength of 2263. The first contingent of nursing sisters to proceed overseas were the members of Nos. 5 and 15 General Hospitals totaling 129 nurses. They sailed from Halifax on the *Duchess of Bedford* and arrived in England on 21 June 1940. They were soon followed by the second group numbering 34 on the *S.S. Georgic* and by the end of 1940, 227 nursing sisters were on duty in England.

During the build-up period in England from 1940 to 1943 the nursing service strength rose to 1016. The work during those years was much the same as in civilian life and if it was called dull it was only dull by comparison to the greater activities that lay ahead. Apart from the routine care of the sick and injured of the Canadian Army the nursing sisters were kept up to date on the latest developments in the treatment and care of war injuries. Lectures were given in modern war surgery. A wealth of information regarding shock, blast injury, new orthopaedic treatment, and intravenous therapy was accumulating from the experience gained in the treatment of air raid casualties. An exchange system was instituted whereby nursing sisters served in units other than their own, learning new ideas on treatment and gaining much experience in specialized fields. The nursing sisters of casualty clearing stations gained experience in actual field conditions in the many schemes in which these units participated. The first actual contact with battle casualties came as the result of the Dieppe raid and experience was gained on the methods of handling a sudden large influx of casualties.

In July 1943 two Canadian general hospitals (Nos. 5 and 15) with their full complement of nursing sisters were ordered to an active theatre of war;

No. 5 going to Sicily and No. 15 to North Africa. The former unit was greatly handicapped by the loss of its equipment in Augusta Harbour, Sicily, as a result of enemy action, but the nursing sisters were able to assist several British casualty clearing stations established at Syracuse, Sicily, until the unit was re-equipped.

The unit did not remain long at Syracuse and late in August it moved to Catania where the nursing services suffered their first casualties of the campaign. During an air raid a light anti-aircraft shell hit the sisters' mess wounding 12 nursing sisters but none fatally. No. 15 Canadian General Hospital took over the role of base hospital in North Africa under canvas and suffered the sweltering heat of the African sands, shivered in the cool nights, and braved the November torrential rains. In February the unit moved to Italy.

The first Canadian nurses arrived in Italy in November 1943. The pleasant sea voyage described in many war diaries was not included by the units aboard the S.S. *Santa Elena* among which was No. 14 Canadian General Hospital. Shortly after the convoy had entered the Mediterranean it was subjected to heavy air attack during which the *Santa Elena* together with two other ships were sunk by aerial torpedoes. Ninety-nine nursing sisters were rescued by life boats and taken aboard either the S.S. *Monterey* or escorting destroyers.

The nursing sisters shared the numerous medical problems of the Italian campaign. Malaria, always a constant menace, added much to the work of the nursing sisters. The long, narrow, single roads made casualty evacuation so difficult that hospitals had to be moved as far forward as possible often within the sound of heavy gun fire, exposed to the Luftwaffe attack, and working under the most adverse conditions. Casualty clearing stations, field dressing stations, and field surgical units to which nursing sisters were attached were often set up ahead of the gun site and sometimes under observation of enemy positions.

During the winter of 1943-44 on the Ortona front casualties were constant. Troops were forced to live under indescribable conditions of hardship, and the nursing sisters shared these conditions but still managed to give the highest calibre of professional care and always with a cheerfulness never to be forgotten by the Canadian troops. As an example of the volume of work done during this winter No. 1 Canadian General Hospital situated on this front handled more than 8000 patients from December 1943 to April 1944.

In the spring of 1944 as the fighting shifted to the west of the Apennines the nursing sisters of the general hospitals, casualty clearing stations, and field surgical units followed closely behind the advancing troops, working and living in the most adverse conditions. They slept in ambulance cars, under canvas, and in bomb-torn buildings. They worked at top speed and in some

cases almost to the point of exhaustion. Between 13 May and 4 June 1944, a period of only 20 days, the total number of Canadian casualties numbered 2212 all ranks, most of whom were cared for by our own sisters.

The record of the nursing sisters in North-West Europe was a repetition of their gallantry in the Italian campaign. For many their first contact with battle casualties came soon after D Day when the first wounded came back to England. As soon as the Normandy bridgehead was large enough to contain casualty clearing stations and general hospitals the nursing sisters were sent to this theatre. The casualty clearing stations were set up within a few miles of Carpiquet and the general hospitals were established at Bayeux which was commonly called "Harley Street". Those first hectic days in Normandy will always be remembered by the nursing sisters. It was hot, noisy, and very busy; the constant pressure of work made night and day identical.

The battles of Caen and Falaise were great proving grounds for the sisters, and when the pursuit across North-West Europe took place it was an experienced nursing service that followed. During the pursuit the field dressing stations and the advanced surgical teams with their complement of nursing sisters followed closely behind the advancing troops. At about this time an advanced Nursing Sisters' Reinforcement Pool was formed and sisters from various hospitals were attached to a small 200-bed hospital at Montreuil, France, and from here they were sent forward to casualty clearing stations and field dressing stations wherever their services were most needed. During the winter of 1944-45 when conditions became more static, hospitals were opened as far forward as Antwerp, Turnhout, and St. Michelsgestel, and except for the occasional casualty the work was mostly the normal care of pneumonia, influenza, and infectious diseases.

The great spring offensive of 1945 with the clearing of the Reichswald, the Hochwald, the crossing of the Rhine, and the push through Northern Holland, made the months from February to VE Day active and very busy, and when victory was finally accomplished the nursing sisters could look back on a job well done. Throughout the whole campaign the nursing service was controlled by a Senior Principal Matron at Canadian Section 1st Echelon. She was responsible for posting, attachments, reinforcements, and general efficiency of the nursing service together with the general welfare of all nursing sisters under her command.

In Canada in the initial stages of the war the nursing service was governed by a Matron-in-Chief at National Defence Headquarters but as the service expanded a Principal Matron and a Matron were added to the staff. Likewise as the permanent hospital installations expanded, principal matrons, assistant matrons, and sisters-in-charge were added to the home war establishments, depending on the bed capacity of the hospital. The military hospitals in Canada eventually reached a bed capacity of 13,057 and constituted the training grounds for all newly appointed officers.

Later a schedule of reinforcement and rotation was worked out whereby every sister had an opportunity of serving in one or other of the theatres, which included Newfoundland, England, North Africa, Sicily, Italy, North-West Europe, and in hospital ships. Two members of the R.C.A.M.C. nursing service went to Hong Kong with the Canadian troops and carried out their nursing duties for two years as prisoners of war.

In 1944 the district establishment was re-organized. Previously the district medical officer was responsible for the nursing service in the district but as the service expanded he found it increasingly difficult to deal with the many and varied problems that arose. The need for district medical officer advisers in nursing matters became apparent and a District Principal Matron or in some cases a District Senior Matron was appointed. District principal matrons in the rank of major were appointed to Military Districts NOS. 2, 3, 6, 7 and Pacific Command and the senior matrons in the rank of captain were appointed to Military Districts 1, 4, 5, 10, 12, and 13. They were directly responsible to the district medical officer for advice on matters pertaining to the nursing service generally and for liaison with existing professional nursing organizations, hospitals, and other associations.

Following the appointment of Miss E. F. Pense as Matron-in-Chief, C.M.H.Q., in April 1940, Miss E. L. Smellie was appointed as Matron-in-Chief in Canada, a position she held until her retirement in July 1944. Besides her very capable administration of the nursing services, Miss Smellie worked in close liaison with the Canadian Red Cross Society and St. John Ambulance Brigade to provide volunteer aid detachments for military hospitals in Canada. Her advice was constantly sought in all matters pertaining to nursing care, even outside the scope of the R.C.A.M.C. She gave valuable assistance regarding the enlistment of Canadian nurses for service in South Africa. She assisted in the mobilization and was directly in charge of dietitians, physiotherapy aids, occupational therapy aids, and home sisters. She was appointed Colonel on 1 February 1944 and has the distinction of being the first Canadian woman to attain that rank. Following her retirement she was succeeded by Miss D. I. McRae, who held this post until September 1945. She was succeeded by Miss Agnes C. Neil, who, following her appointment as Matron-in-Chief, C.M.H.Q., in 1942, had the responsibility for the development and training of a very large force of Canadian nursing sisters and their placement throughout the three theatres of war. The energy, wisdom, and care which she used in carrying out her duties made a great contribution to the welfare of the sisters and the patients for whom they were caring.

DIETITIANS

The appointment of fully trained dietitians added a new branch to the nursing service of the R.C.A.M.C. Dietitians were employed in the First World War but only in a civilian capacity being employed and paid by the

Military Hospital Commission. G.O. 93 of 1940 authorized the appointment of one dietitian to each 1200 and 600-bed hospital, but this order was later amended and dietitians were included in the establishment of 250-bed hospitals, conditioning centres, and women's service health centres. On 12 June 1940 the D.G.M.S. wrote all districts outlining the requirements and necessary qualifications for appointment of dietitians as follows:

- (a) Must be under forty-five (45) years of age.
- (b) Unmarried or widow without dependent children.
- (c) A graduate of a recognized university and in possession of a diploma in Household Science or Dietetics.
- (d) Wear the uniform of a nursing sister.

They received the same relative rank as nursing sisters and were appointed in much the same manner. Dietitians enlisted between 1940 and 1944 qualified at various hospitals under the same regulations as the nursing sisters. They received very little special training in their own field and consequently experienced many difficulties both in Canada and overseas. With appointment of a Consultant in Nutrition at N.D.H.Q. in 1944 it was decided to qualify all dietitians at Camp Borden Military Hospital. At the end of the regular course taken with the nursing sisters, lectures were given by the Consultant in Nutrition and a definite training programme was conducted by the Senior Dietitian at Camp Borden Military Hospital.

The duties and responsibilities of dietitians in the R.C.A.M.C. were not at first fully defined. The Canadian Dietetic Association through its War Service Committee was requested by the D.G.M.S. to outline the duties and responsibilities of dietitians in civilian hospitals, but as they were not applicable to military hospitals the Association made certain recommendations for the consideration of the D.G.M.S. On the basis of these recommendations the D.G.M.S. in a circular letter outlined the duties of dietitians as follows:

The Dietitian of a Military Hospital is directly responsible to the Commanding Officer of the Unit. It is her duty to ensure that adequate quantities of food of suitable quality are made available from the Quartermaster for use in the kitchen.

The Dietitian is in charge of the Kitchen, responsible for general oversight and management, for the planning of the patients' meals and special diets, the proper care and conservation of the food allotted for use in hospital and for the allocation and performance of their duties by the kitchen staff. Should the necessity for disciplinary action arise, the situation is dealt with through the regular channels.

The care and condition of the food after it arrives in the ward, and the serving of food in the ward are the duties of the nursing sister in charge of the ward. There should be full co-operation between the Dietitian and the Nursing Sister and it is the responsibility of both to see that the patients are properly served the diet ordered by the Medical Officer. In this they are directly responsible through the Matron to the Commanding Officer.

As the Dietitian wears the same uniform; lives in the Nursing Sisters' Quarters and has the privileges of the Mess, she is responsible to the Matron of the Hospital as regards conduct, discipline, hours of duty, recreation, and dress.

In 1943 the requirements for qualification were raised and it was necessary for all candidates to hold a degree in household science or dietetics and have post-graduate experience in a hospital of recognized standing and be eligible for membership in the Canadian Dietetic Association.

In March 1944 Miss G. G. Taylor, of the Home Economics staff of McGill University was appointed as Consultant in Nutrition at N.D.H.Q. She was carried on the General List Non-Medical R.C.A.M.C. in the acting rank of captain but was later promoted to the rank of major. Miss Taylor, although Consultant in Nutrition for the whole Canadian Army exercised wide influence over the dietitians in the nursing service. It was through her untiring efforts that authority was granted to appoint permanent district advisers in the rank of captain to act as advisers to the district medical officer to see that all medical installations were adequately supervised concerning proper diets.

The dietitians of the nursing service R.C.A.M.C. although small in number were nevertheless a very important part of the Corps. Nutrition, a relatively recent science, began to take its proper place in the treatment of disease and the recuperation of the injured. It was only proper that the feeding of Canadian casualties should be under the supervision of specialists trained in the science of nutrition. Their task was not an easy one and sometimes the preparation of meals took place in an open field and often in the crudest type of kitchen. Physicians and surgeons depended on the dietitians to carry out their orders and to transform bulk hospital ration into appetizing and scientifically balanced diets. Ingenuity and knowledge were necessary in planning a varied menu as hospital rations although of excellent nutritional value were nevertheless limited in the number of commodities available.

PHYSIOTHERAPY

The Canadian Physiotherapy Association, established in 1920 under Dominion Charter, in an endeavour to maintain the high standard of their profession and to guard against certain recognizable errors of the First World War, as early as January 1939 approached the D.G.M.S. to consider "the formation of a corps of *trained* workers (in physiotherapy) who would be available in the event of war, — or that some consideration be given to the need of training for war purposes, while there is still time to avoid the necessity of short and insufficient periods of training" and "that members of this association could be approached as to their willingness to serve, if the necessity should arise, and that some thought be given to the training facilities available, so that any training that may be found necessary should conform to the standard now established in Canada".

The Deputy Minister in his reply stated that the need for employment of well trained and experienced technicians was appreciated but the Department of National Defence was unable to give any direct assistance in this

regard at the present time, but he went on to suggest that a nominal roll of all qualified personnel should be forwarded and placed on file for further reference.

Following the outbreak of hostilities the question of physiotherapy in the Canadian Army again came under discussion and the need for a firm policy was recognized. The Canadian Physiotherapy Association reiterated its willingness to do its part. Many requests for trained physiotherapists began to pour in. The officer commanding No. 15 Canadian General Hospital wrote to the D.M.O. M.D. 2 suggesting the establishment of a general hospital be altered to include one or two trained female physiotherapists. The Consultant in Radiology who had a keen interest in physiotherapy as it was under the supervision of the Radiological Division in the First World War, suggested the need for training of suitable physicians and surgeons in physiotherapy capable of doing manipulative therapy. A physiotherapy department in charge of a physician or surgeon trained in physiotherapy would "save days of hospital care and many days of manpower for the army".

The Canadian Physiotherapy Association through their Military Affairs Committee which was formed to organize their members for military purposes and to collaborate with the armed forces urged the Department of National Defence to protect the standards of physiotherapy that it had laid down. The Association since its formation in 1920 had struggled untiringly to elevate the standard of physiotherapy in Canada and had set the requirements for membership in the Association as honour matriculation, two years course in physiotherapy at an approved school, and six months compulsory internship in a recognized hospital. They pointed out that in the First World War as many as 250 physiotherapy aides had only six months training and that this had much to do with the low standard of physiotherapy in Canada following the First World War, It was also argued that half the number of well trained personnel would do an equal amount and better type of work than a partly trained staff.

On 27 December 1939 the D.G.M.S. in a memorandum to the Adjutant General urged the recruitment of physiotherapists and estimated that the requirements would be three to a 1200-bed hospital and two to a 600-bed hospital. In another letter to the Adjutant General the D.G.M.S. laid down the requirements for appointment as follows:

- (i) A British subject and physically fit for military service.
- (ii) Under 45 years of age, single or widow without children.
- (iii) A graduate of an approved school of physiotherapy and a member in good standing of the Canadian Physiotherapy Association.

G.O. 93 of 1940 authorized the appointment of physiotherapists and set the numbers as three per 1200-bed hospital and two per 600-bed hospital. At

first they received rank and pay of a second lieutenant but in June 1942 promotion to the rank of lieutenant was granted after a qualifying period of six months. The minimum age limit which was first set at 25 years was later lowered to 21 years.

There were two other noteworthy changes in regulations governing physiotherapists. One was the formation of a reinforcement pool which enabled the temporary attachment to a home establishment hospital while awaiting permanent posting either in Canada or overseas. The other was permission for graduates to take the last three months of their six months compulsory internship in a military hospital provided they were under the guidance of a more experienced physiotherapist.

The method of appointment was governed by the close liaison between the D.G.M.S., D.M.O., and the Canadian Physiotherapy Association; the latter through its Military Affairs Committee submitted to D.G.M.S. from time to time the names of all physiotherapists who were eligible and willing to serve in the armed forces and further advised the army medical service of the suitability of each individual to any particular hospital and their qualification for senior appointments. Thus the Association through its Military Affairs Committee acted in an advisory capacity to the D.G.M.S. until 1944 when Miss E. J. Ely, a physiotherapist with much overseas experience both in the United Kingdom and Italy, was appointed as adviser in physiotherapy at N.D.H.Q. She was given the rank of captain on her appointment and was later promoted to the rank of major.

In Miss Ely physiotherapy both in Canada and overseas had an able leader and excellent organizer. Her task was no easy one as there was an acute shortage of trained physiotherapists in Canada. To relieve this shortage she advocated the training of members of the Voluntary Aid Detachments as assistants in physiotherapy.

The work of the physiotherapists throughout the war will long be remembered by all veterans who came under their expert care. They were an integral part of the vast field of rehabilitation which included in its scope many fields of curative effort. The physiotherapist began her work at the bedside of the patient and did not cease until the soldier was restored to his fighting unit or discharged to civilian life as a functionally useful citizen.

That so much work could be done by so few was due to the fact that group exercises were employed whenever possible. The common conception that physiotherapy is given to one individual at a time according to his disability was an erroneous one. The individual and his specific disability was the starting point only. Treatment must of necessity be individual at first in order that the patient grasp the method to be employed in his rehabilitation, but at a later stage several similar or even dissimilar cases were treated with active exercise in a group, later progressing to a class which in time was handed over to physical training instructors.

OCCUPATIONAL THERAPY

Before the formation of the occupational therapy branch of the R.C.A.M.C. came into being there was conducted in the Canadian military hospitals in England a type of diversional therapy under the auspices of the Canadian Red Cross. They supplied partially trained volunteers to teach and assist in occupational therapy in each hospital. They supplied the material with which the patient worked on a payment basis, later selling the manufactured articles for the patient if he so desired.

The work entailed had progressively increased to such an extent that the Red Cross felt that there should be a fully trained occupational therapist in each hospital and this feeling was shared by the D.M.S. (C.M.H.Q.) who in a letter to the D.G.M.S. expressed his views that some form of occupational therapy was necessary in the overseas hospitals. He also pointed out that the personnel should be appointed in the same manner as physiotherapists for pay and allowances and discipline.

The D.G.M.S. in his answer to this request asked for further information on the work of the Red Cross but intimated that although occupational therapy was a very suitable adjunct to the treatment of patients who were remaining in hospitals for protracted periods of time, it was the policy to return to Canada all such cases that required prolonged hospitalization and if occupational therapists were to be employed at all, Canada would be the logical place, probably in the military hospitals but more usefully in the Department of Pensions and National Health hospitals as it was the general policy to discharge all category "E" personnel and those not likely to be fit for service in six months to the latter institutions.

A change in the attitude of the D.G.M.S. towards occupational therapy was brought about following his visit to the United Kingdom early in 1942. At that time he got first-hand information on the work done by the Red Cross but nothing appears to have been done until early in 1943, when the D.G.M.S. in a cable to D.M.S. pointed out that consideration was being given to the employment of occupational therapists who were graduates of recognized schools and members in good standing of the Canadian Occupational Therapy Association. He stated that these would be employed in home war establishment hospitals and that appointments might be on the same scale as physiotherapists and under regulations governing the nursing service. He asked the D.M.S. if he considered it necessary to include occupational therapists in the establishment of general hospitals about to proceed overseas. The answer to his cable is not available now but it was in favour of occupational therapists being attached to overseas hospitals. *

* See 5/Hosp. /1 /3.

The final approval effective 1 August 1943 for the employment of occupational therapists was outlined in G.O. 423 of 1943 and it listed the requirements for appointment as:

- (1) British subject physically fit for military service.
- (2) Under 45 years, unmarried or widow without children.
- (3) A graduate of a recognized school of Occupational Therapy and a member in good standing of the Canadian Association of Occupational Therapy.

They were commissioned in the rank of second lieutenant and attached to a hospital for qualification and then posted where their services were most needed. Following a six months period in the rank of second lieutenant they could on recommendation be promoted to the rank of lieutenant. They wore the same uniform as the nursing sisters and were responsible to the matron only as far as conduct and general deportment in the mess and living quarters. Their duties and responsibilities as far as their technical skill was concerned were as follows:

The provision of suitable occupations for all patients for whom Occupational Therapy has been prescribed by a Medical Officer.

The ordering through proper channels of all authorized Occupational Therapy equipment and supplies required for the efficient function of the Occupational Therapy Department.

The care and maintenance of equipment and tools.

The collecting of and accounting for monies from patients for completed articles retained. (In order to comply with G.O. 490/44).

Furnishing reports as required by the Commanding Officer of the hospital.

The supervision and allotting of duties to non-professional Occupational Therapy assistants (Army).

The supervision of any handicraft work carried out by volunteer organizations. (In the case of a volunteer organization wishing to carry out a handicraft programme in the smaller hospitals where there is no Occupational Therapist on strength the Director General of Medical Services will be notified. Arrangements will be made for the Occupational Therapy Adviser to supervise the organization of such a programme.)

There was a shortage of fully qualified occupational therapists both in civilian life and in the armed forces, and to compensate for this shortage it was proposed to train Canadian Women's Auxiliary Corps personnel as occupational therapists' assistants. This proposal was first put forward by Colonel English, Consultant in Physical Medicine, and he proposed two alternative methods of training. First he suggested that selected Canadian Women's Auxiliary Corps personnel be attached to military hospitals and that they receive training under the direct supervision of the occupational therapist in the home war establishment, or secondly to assemble a group of girls in a central conditioning centre and employ a chief instructor such as the educational officer of a conditioning centre who had training in occupational therapy.

The second proposal was adopted but the course was under the direction of the Canadian Occupational Therapy Association. Arrangements were

made to have a class of 64 selected Canadian Women's Auxiliary Corps personnel but only 14 reported and of these only 11 qualified. As a result the D.G.M.S. was forced to adopt Colonel English's first proposal and in lieu of special training centres, selected Canadian Women's Auxiliary Corps personnel were posted to military hospitals for general duty and then trained locally under the occupational therapist on the establishment.

In February 1944 the first occupational therapists were posted overseas and by June of that year most large hospitals had at least one occupational therapist on their strength. They reached their maximum strength of 37 in January 1945.

At first their progress was slow. Their number was small and they had no representative at C.M.H.Q. to push their interests or organize their work. Their scale of issue was foreign to the R.C.A.M.C. and the quantity and quality of equipment were not up to standard. Also it was during this period that the invasion of North-West Europe was at its height and all occupational therapists although anxious to get their own department working smoothly nevertheless put their own interests in the background and gave a helping hand to the other departments of the hospital often working in the offices, helping nursing sisters on the wards, and assisting in the documentation on the arrival of convoy.

As the hospitals began to settle back into a more normal routine following D Day, the need for more extensive occupational therapy became apparent. The Red Cross which was, prior to this time, responsible for most of the handicraft programme in military hospitals now directed their attention to more urgent duties in North-West Europe. They turned over most of their supplies to the occupational therapy departments. A total of 23 of their handicraft personnel joined the ranks of the occupational therapists as assistants. Due to the combined efforts of those 37 fully qualified occupational therapists and the 23 trained Red Cross assistants, occupational therapy steadily expanded and in 1945 a monthly average of 3856 patients were receiving this form of therapy. Much of the progress recorded in the preceding paragraph was due to the untiring efforts of Miss Margaret E. Irvine (Captain O/T). She was attached to C.M.H.Q. in an advisory capacity to the D.M.S. and later she returned to Canada to take over the duties of Occupational Therapy Adviser at N.D.H.Q.

HOME SISTERS

A new branch of the nursing service R.C.A.M.C. known as Home Sisters was created; during the early days of the Second World War. During the First World War a few women anxious to serve but lacking the professional qualifications necessary to become a nursing sister were taken on strength as home sisters. They added much to the comfort of the nurses. In 1940 a home sister was added to the war establishment of the 1200-bed,

600-bed, and neurological hospitals. They were appointed in the provisional rank of second lieutenant with the pay and allowances of that rank. Following a two weeks course in a military hospital they could be appointed to the relative rank of second lieutenant.

The home sister required no special technical knowledge but was chosen for her adaptability, resourcefulness, and diplomacy. She was required to have a good educational background and a pleasing personality, knowledge and experience in household management, and ability to direct as well as work with others. She was directly responsible for the care and household management of the sisters' quarters.

Her duties were outlined as follows:

- (a) To act as liaison officer between the Matron and the nursing sisters in relation to their home environment.
- (b) To allocate and direct the activities of personnel detailed for duty in the Sisters' Mess.
- (c) To be responsible to the Matron for keeping accounts for the proper care and conservation of food and checking of supplies.
- (d) To be responsible for the supervision and serving of the Sisters' meals and for carrying out such minor duties as may be required for those Nursing Sisters temporarily off duty ill in quarters.
- (e) To act as deputy for the Matron as occasion may arise and loyally to co-operate with her in maintaining a congenial and homelike atmosphere in the Sisters' quarters.

Technically she was of lesser significance than the other branches of the nursing service but was nevertheless chosen with great care on account of the tact and diplomacy needed in the performance of her duty. Good household management and a congenial homelike atmosphere in the sisters' quarters were as relatively essential to the morale of the nursing sisters as good leadership.

This small but important branch of the nursing service R.C.A.M.C. saw service in every theatre where Canadian general hospitals operated; first during the long waiting period in England, then North Africa, Sicily, Italy, and finally North-West Europe. They performed their duties in all types of accommodation from the permanent hospitals of Canada to the canvas tents of Sicily. They brought much-needed cheer and domestic comforts to the weary overworked nurses on the very border of the Canadian battlefields. Sixty-eight home sisters enlisted in the Canadian Army and of this number 43 served overseas.

RULES AND REGULATIONS COMMON TO ALL BRANCHES OF THE NURSING SERVICE

Women selected as dietitians, physiotherapists, occupational therapists, and home sisters, all new to the medical corps, were on appointment carried on the Nursing Service, General List R.C.A.M.C., and were referred to as

members of the Nursing Service. Hence there was little distinction between the various branches with respect to rules and regulations. The following account will suffice to illustrate the major problem that developed in this connection.

During the long and colourful history of the nursing service, members of that service were granted the relative rank of officers. They did not possess the status of officers because the relative rank did not carry with it the power of command exercisable by a commissioned officer of corresponding rank. In 1942, P.C. 4059 was passed giving authority to grant commissions and the power of command to members of the nursing service selected to serve as officers. Their powers of command were restricted to such personnel as were placed under their command and they did not have individual powers of punishment. They were eligible to sit as members of courts-martial at trials of members of their own service but were not permitted to be appointed as presidents. The granting of commissioned ranks to members of the nursing service marks a very definite turning point in their army career. They were put on an equal footing with all other commissioned officers of the Canadian Army and they were justly proud of the honour bestowed upon them. It was a fitting recognition for a service that had over the past years built up such a glorious record.

The regulation that appears to have caused the most difficulty in the nursing service was that concerning marriage. A pre-war regulation required a member to relinquish her appointment on becoming married. It did not act as a great deterrent, and as the nursing service rapidly expanded under the impact of war, army authorities, especially those in the United Kingdom, alarmed at the increasing loss of trained personnel and concerned over the resulting waste of public funds in training and transportation, requested an early revision of this regulation.

An amendment in the attestation form in 1941 requiring all members of the nursing service to sign an undertaking not to seek permission to marry until they had at least one year's service did not improve the situation to any appreciable extent. A year later the D.A.G., C.M.H.Q., acting on suggestions from both the Matron-in-Chief and the D.M.S. proposed to the Senior Officer (C.M.H.Q.) that "steps should be taken to adopt a policy permitting the retention in the service of members of the nursing service who have been married with permission". The Senior Officer in turn urged N.D.H.Q. to adopt a new policy towards marriage. The question remained under consideration until February 1943 when G.O. 49 of that year authorized the retention in the service of a married member of the nursing service until such time as she was physically disqualified for active military duty. She was then retired on compassionate grounds but could be reappointed on the recommendation of the D.G.M.S. or D.M.S. (overseas). New recruits were still required to sign an agreement that they would not seek permission to

marry until they had completed not less than one year's service or if overseas until they had completed one year's service, six months of which must be outside of Canada.

The age limits for members of the nursing service underwent several changes during the war. In 1939 candidates for appointment had to be between the ages of 25 and 45, but in May 1942 the age was lowered to 23 and in September 1943 it was again lowered to 21 years. The upper age limit was extended to 55 years except in the case of permanent force officers who if medically fit were permitted to continue beyond this age limit until completion of the requisite service for pension.

CANADIAN NURSES IN SOUTH AFRICA

During the early years of the war the South African Government proposed to augment its own military hospital programme by the addition of 8000 military hospital beds for the treatment of Imperial casualties from the Middle East. The serious shortage of nurses in the Union forced the Government to seek the assistance of the Canadian Government, and on 18 June 1941 the South African representative in Canada approached the Department of External Affairs and requested permission to recruit Canadian nurses for service in the South African Military Nursing Service. The Canadian Government was only too willing to be of assistance and permission was granted to recruit up to 300 trained nurses.

It was agreed between the two governments that the selection, medical examination, and documentation would be done by the R.C.A.M.C. Pay and allowances including transportation, clothing, and pension would be taken care of by the South African Government but due to a shortage of nurses uniform material in South Africa, it was requested that the Canadian nurses obtain their uniforms in Canada. For this purpose a \$150 clothing allowance was paid by the Union Government.

No difficulty was experienced in obtaining the required number of volunteers. The eagerness of the Canadian nurse to do her part wherever needed was clearly shown by the rush of applicants. By July 1942, over 300 Canadian nurses had been recruited and of this number 299 were serving in the South African Military Nursing Service.

Each nurse was requested to sign a certificate to the effect that she would serve one year, with the option to renew her contract for further service if she so desired. Many renewed their contract after one year's service and saw service with the South African Military Nursing Sisters in the Middle East, North Africa, and Italy.

The rates of pay and allowances were those of the South African Military Nursing Service and it was the unfavourable difference between South African and Canadian military nursing service pay that caused the most difficulty. The misunderstanding appears to have arisen in the interpretation

of the early instruction issued. In an Adjutant General letter to all district officers commanding it was stated that the pay of a staff nurse in the South African Military Nursing Service was \$1036.62 and that of a sister was \$1235.97. It was not understood at that time that accommodation and rations were included in these figures and if government accommodation and rations were supplied a monthly deduction of approximately \$37.90 would be made. It was mainly the difference in pay between the South African Military Nursing Service and Nursing Service R.C.A.M.C. that forced approximately 100 nurses to return to Canada after one year's service. Towards the end of the war all nurses who served in the South African Military Nursing Service were, by government action*, granted the same re-establishment benefits as other members of the Canadian armed forces.

* P.C. 6938 dated 15 November 1945.

THE MEDICAL BRANCH OF THE ROYAL CANADIAN NAVY

ORIGIN

Between the First and Second World Wars the Royal Canadian Navy was little more than a token force. In September 1939, it consisted of six small destroyers and 1700 officers and men. The last permanent medical officer had left the service in August 1924. From that date the meagre medical needs of the Canadian Navy were met as part of the normal duty of the medical officers of the Canadian Army. These officers held daily sick parades in the dockyards at Halifax and Esquimalt, and such cases as required hospital treatment were sent to military hospitals or hospitals of the Department of Pensions and National Health. When the few ships then in commission were required to cruise for manoeuvres, a military medical officer would be detailed for duty afloat.

Although the medical branch of the permanent Navy was dead, a flicker of life remained in the medical activities of some half dozen of the 20 divisions of the Royal Canadian Naval Volunteer Reserve which functioned in 20 cities throughout Canada. In these six divisions a practising physician took an interest in naval activities through the examination of recruits; by the occasional attendance at midweek training periods; by turning out to ceremonial parades or inspections; by taking part in the ship's companies' social functions; and by infrequent visits to the naval base at either coast for a week or fortnight of training, or possibly a short cruise.

Such then was the exceedingly small nucleus of medical officers summoned to duty on 3 September 1939. Allocated in equal numbers to the naval bases at Halifax and Esquimalt, they took up the work of final appraisal of fitness for service of the thousands who poured into these establishments, and they supplied the subsequent medical care.

MEDICAL OFFICERS AT RESERVE DIVISIONS

The reserve divisions throughout the country became busy centres of recruiting activities, but without benefit of medical officers trained to the requirements of the Navy. Nevertheless, the newly entered doctor was quick to learn. The Recruiting Manual contained standards of physical fitness, but how closely these were to be applied in time of warfare became a matter of some importance, and of broad individual judgement. What does it profit a nation to have a physically perfect force, but only in such numbers as could lose a war? Consequently the medical officer was directed that trivial and repairable defects should not prohibit the entry of an enthusiastic

patriot who sincerely desired to serve his country; nor should an exaggerated view of minor complaints exempt the less willing volunteer. Organic disease, with any likelihood of aggravation by service, would automatically eliminate a recruit; but there was, nevertheless, a reasonably wide margin in fitness between a seaman on the bridge and the less arduous duties required between decks.

That the work of these medical officers at recruiting centres was of a high order is shown by the fact that of one hundred and five thousand recruits examined only 10.1% were rejected upon medical grounds, and of those accepted only 3.5% were later eliminated for medical reasons. Since the wear and tear of service life in six years of warfare would give cause for more than half of these discharges, it is seen that the error of the recruiting medical officer would be little more than 1%, and this figure would include the recruit who did not admit to epilepsy, ulcer, or other conditions not readily discernible in the type of physical examination it is possible to conduct at recruiting centres.

Valuable as the more experienced medical officer was at the recruiting centres, he could not be denied the opportunity desired by all naval personnel to serve at sea. As the more recently entered medical officer became sufficiently indoctrinated to carry out the routines of a recruiting centre, the more senior officer was transferred to the coast where a still wider experience awaited him. Having become acquainted with naval life and ship's procedures at an inland centre, the service was less a mystery, and the embarrassment of the newcomer was diminished or eliminated when he at last reported for duty at a larger naval base. At a still later period in the war this cycle of duties again brought many of these doctors back to a naval division for another turn of duty. By this time they were matured through service under all conditions, and so able to impart additional knowledge to the junior colleague, particularly as to the physical requirements of the recruit, for now they had first hand experience of the work and duties of a ship's company at sea in fighting craft or even in action.

ROTATION OF DUTY

With the exception of a very limited number of more senior administrators it became policy in the medical branch to rotate all medical officers through various appointments at short intervals. Seldom was an officer left more than six months at a recruiting centre, or more than six months at sea. Neither was he left more than a year in any one naval base. This avoided any suggestion of an officer becoming a forgotten man, prevented boredom, distributed more equitably the preferred appointments, enlarged acquaintance with fellow officers, both medical and non-medical, and gave an insight into the varied methods of administration, which was an education for the time when many medical officers in turn might have an opportunity for



R.C.N. HOSPITAL, ST. JOHN'S, NEWFOUNDLAND

A nursing sister accompanies a surgeon-lieutenant on his rounds of the various wards, 27 July 1942. Here they are shown in one of the main wards checking the chart of an injured patient.

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administrative duties. It was hoped by such rotation that the largest number possible could ultimately boast of having been everywhere and having seen everything. This policy might have been upsetting to one's economic stability, particularly if married, but it was considered that rapid rotation did the greatest good to the largest number, bearing in mind always that a war is not a matter of anyone's personal convenience. Furthermore, from the more fully trained specialists, who it might be thought could make their greatest contribution in a base hospital, there came persistent requests that they be allowed their share of seafaring. Such demands were satisfied upon the hypothesis that all should accept the hazards of the sea; and by such duty one became fully appreciative of the life lived by those one served. To know the way of a sailor one had to be a shipmate with him, see his quarters, share his food, learn his language, then when he was seen in sick parade or hospital ward there was a common basis for confidence — a vital element in the treatment of the sick or injured.

NAVAL HOSPITALS

In September 1939 there were no naval hospitals, not even a bed ! As inclement weather approached, all available space within army and other federal hospitals was soon filled to capacity. Improvisation was instituted in barracks buildings, empty houses, and even under a grandstand in the fairgrounds. Ultimately temporary hospitals were erected at Halifax and Esquimalt to be followed later by the addition of more permanent structures. But the Navy itself grew so rapidly it could not be confined within these two bases. Additional establishments were provided at Cornwallis, Sydney, and Shelburne in Nova Scotia, St. Hyacinthe in Quebec, St. John's in Newfoundland, and Greenock in Scotland. In all, nine naval hospitals were built or acquired, with an approximate total of 2000 beds. Each hospital had its full quota of staff, including specialists in all branches, and contained full equipment for all departments such as radiology, laboratory, physiotherapy and occupational therapy. Each base was therefore equipped to meet its own needs.

The hospital in H.M.C.S. *Niobe* at Greenock was of great comfort to those employed on the convoy routes who became ill or injured in this strenuous service. It was literally a haven for the nautical human flotsam and jetsam who were always turning up in odd ways from strange places. This hospital kept close liaison with the R.C.A.M.C. in the United Kingdom and frequently benefitted by advice and counsel from the Army's touring consultants.

HEADQUARTERS

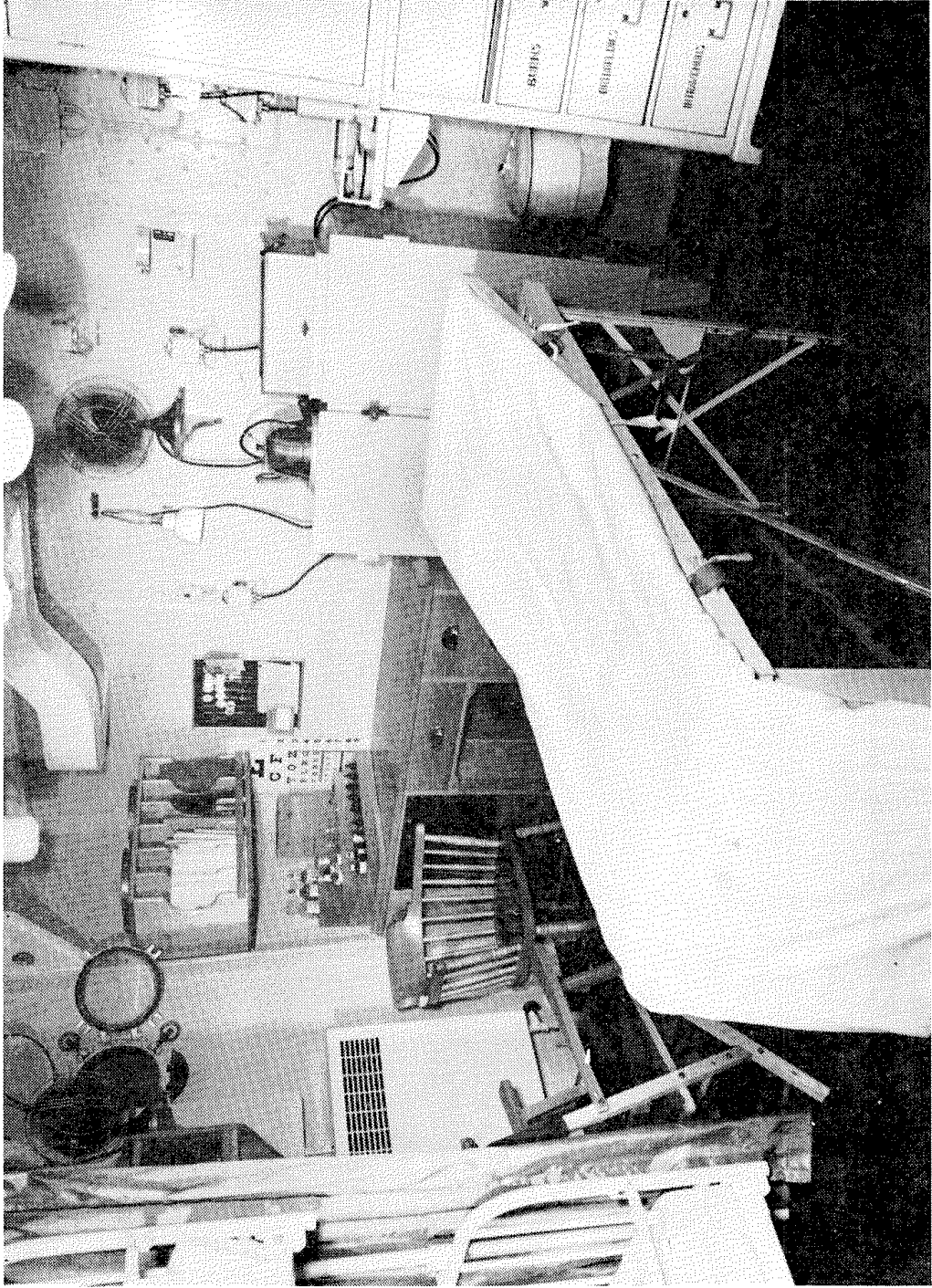
During the First World War and throughout the years of peace, and for the first five months of the Second World War, Naval Service Headquarters

did not have a naval medical officer on its staff. Naval medical problems were referred to the Director General of Medical Services of the Army, but with the increasing tempo of war this director suggested to the Chief of Naval Staff that it might be more satisfactory to all concerned, were the Navy to deal with its own problems by a staff more familiar with naval regulations and requirements. Consequently, in February 1940 the Senior Naval Medical Officer of the Royal Canadian Naval Volunteer Reserve was transferred from Halifax to Naval Service Headquarters in Ottawa and appointed Staff Medical Officer to N.S.H.Q. The following year the appointment was changed to Director of Naval Medical Services; again when the Naval Board was established, the title was changed to read Medical Director General of the Royal Canadian Navy. This officer carried out these duties throughout the war and on into the postwar period. No attempt was made at Headquarters to set up a separate naval board of consultants in clinical matters or to duplicate in any way the work done by the staff of the D.G.M.S. (Army). Since, as already stated, all naval bases had a self-sufficient staff, advice from Headquarters in clinical matters was kept to a minimum. Central Medical Stores continued to meet naval needs, and other problems of mutual concern were discussed with appropriate Army, Air, or other federal consultants. If a problem peculiar to the Navy arose, discussion would take place with a naval base by telephone, by letter, or by a personal visit to Headquarters of the specialist concerned.

Primarily, the office of the Medical Director General acted as adviser to Naval Headquarters in medical policy, in drafting of correspondence in medical matters, in the adjudication of medical boards, compilation of medical statistics, acquisition of medical supplies, the selection for entry, and appointment for duty of all naval medical officers. With the continual growth of the Navy, and the resulting increase in work at Headquarters, the medical officer strength in the office of the Medical Director General rose from a single officer in 1940, to a total of ten by the end of the war. This phase of a medical officer's experience was also brought within the cycle of rotation previously mentioned; after a short term of duty at Headquarters the officer left for other activities with a broader view of the Navy, and a more mellow attitude towards Headquarters, regulations, brass hats, and the petty annoyances he formerly had felt emanated from an exacting authority.

NURSING SERVICE

With the development of naval hospitals within the service it was obvious that more skilled assistance would be required than was available from the pre-war Sick Berth Branch. In fact, if this branch was to grow and be sufficiently trained to be of any value, it would be necessary to enter registered nurses, not only to minister to the sick, but to tutor and train the Sick Berth staff.



SICK BAY, H.M.C.S. "SPRINGHILL"

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In the autumn of 1941 the Nursing Branch was organized. There was an initial staff of three, but by the war's end this Branch totalled approximately 325. Since the care of the sick involved more than bedside nursing, the Nursing Branch was organized on a sufficiently comprehensive basis to include laboratory technicians, dietitians, physiotherapists, occupational therapists, and home sisters. All members of this Branch had the status of other officers of equal rank within the Naval Service; the registered nurse wore the maroon distinction cloth already used by Wardmasters of the Sick Berth Branch. The other members of the nursing branch wore the green distinction cloth as worn by other technical male officers. In view of this integration of more than one component into a nursing division, the term Nursing Sister was later replaced by Nursing Officer, and each member was called by her rank. This also was in keeping with the uniform she wore which carried officer's gold lace on sleeve or shoulder, officer's buttons, cap badge, black tie, and black shoes. The style of the uniform closely followed that already in use by nurses in the Royal Canadian Army Medical Corps and made easy the recognition of a nursing officer in the Canadian armed forces in whatever country she might be.

While the organization of the Nursing Branch was the responsibility of the Medical Director General, the details of its administration ultimately were passed to a nursing officer selected for the position of Matron-in-Chief, which title was later changed to Director of Nursing Service. She then joined the staff of the Medical Director General at Headquarters.

SICK BERTH BRANCH

Before the introduction of a nursing service into the Navy, the directions of the medical officers for the care of the sick were carried out by members of the Sick Berth Branch. These men, who at the outbreak of war totaled about twenty, had all been given their initial training through a one or two year course ashore and afloat in the Royal Navy. With the great expansion of the Canadian Navy their number had to be increased many fold and their training period shortened, and it was not feasible to send them abroad for such training. Since nursing required technical knowledge above the average, the selection of a well educated, superior type of recruit was essential. To give tuition by lecture, clinic, and demonstration was a further duty now added to the already busy routines of medical and nursing officers. To the credit of all concerned it can be stated that a most efficient branch was developed consisting of 1200 men, to which later were added some 350 women of the Women's Royal Canadian Naval Service. As training progressed and aptitudes were displayed, individual members were allowed to specialize in such fields as radiography, laboratory, physiotherapy, and operating room technique. Many were returned to larger civilian teaching hospitals where this training was perfected to the point of certification by and membership

in various technical associations. A large part of the male sick berth rating's duties was performed in fighting ships on the convoy routes. Since many of these ships carried no medical officer, the sick berth rating was given responsibility for the health of the ship's company and had to rely upon the training he had received and his own judgement. Many were the reports received of the splendid work they did under all conditions of service. As further testimony to their efficiency, three were decorated and 11 were mentioned in dispatches.

MEDICAL RESEARCH

About mid-summer of 1940 the Medical Director General had a personal visit from the Professor of Physiology of the University of Toronto and his associate offering the facilities of that Department and of the Banting-Best Institute of Medical Research in whatever capacity the naval service might see fit to apply it in solving any of the problems confronted by the medical branch. This offer was gladly accepted and within two or three months the R.C.N. Medical Research Division was in full operation. Not only did the heads of the Department of Physiology enter active service and don uniforms, but a large part of their staff did likewise. In fact, the research effort became so comprehensive and far reaching in its scope that most of the purely academic pursuits of the Banting-Best Institute were put aside in favour of naval medical research, and the remainder of its staff, who for various reasons could not wear uniform, devoted most of their time and effort to the more pressing needs of the naval medical service.

Medical research projects were defined as "those relating to the maintenance of health or to the prevention or cure of disease, ailment, or accident arising from duty in the Navy, ashore or afloat". Thus were covered the problems of nutrition, the physical qualities required for special duties, such as acuteness of hearing in ASDIC personnel; visual acuteness or colour perception of seamen; the development of a remedy for motion sickness; the study of ventilation of ships; engine room noises; colour blindness; night blindness; and the practical application of such research in mass examination of personnel at large naval bases and training establishments. The study of conserving and saving life also included the perfection of more adequate life-saving jackets, the preparation of emergency rations, the development of grease-soaked stockings to inhibit immersion foot in the shipwrecked, and many other miscellaneous projects. *

MEDICAL INTELLIGENCE

A still further development in the medical branch was the establishment of a Medical Intelligence Division. About half-way through the war it became

* FEASBY, W. R., *Official History of the Canadian Medical Services 1939-1945*, Vol. II, pp. 333-49.

apparent that the activities of Canadian fighting craft would not be confined to local waters or the Atlantic convoy, for Canadian vessels might find themselves in strange harbours in strange lands with the captain of the ship having some knowledge of anchorages and land marks, but neither he nor his medical officer having any knowledge of the hazards to health which lurked ashore. It was also known that such information was available if it could be located, condensed, and properly distributed. As a result a senior medical officer went to Washington to consult with authorities there on the subject and later he visited the United Kingdom for the same purpose. A liaison resulted between this trio of nations and by establishing two medical officers of the Canadian Navy in the office of the Canadian Naval Attache in Washington, and with the co-operation of the Canadian Army's medical liaison office in London, England, a veritable torrent of literature and factual information flowed into the office of the M.D.G. When this information was sorted out and condensed, it was published in mimeograph form for distribution as semi-monthly bulletins to each medical officer in the Canadian Navy. Shortly afterwards the distribution of these bulletins was made to the medical services of the Army and Air Force. While this was an interesting and valuable development in the field of medicine, its usefulness would have been greatest had the war continued long enough to increase Canadian activities in the Far East.

LOAN OF MEDICAL OFFICERS TO BRITAIN

In the early months of the war Canada's recruiting effort for the Navy was so successful that it was inclined to outrun the building, conversion, and acquisition of ships. Thus when a request was received from the United Kingdom for any officers of all branches of the R.C.N. who could be spared to help man ships of the Royal Navy, it met a ready response. This included medical officers; as more doctors were applying for entry into the Canadian Navy than were immediately required for duty in Canada, it was possible to send to Britain, on loan, 40 junior medical officers. The duration of the loan was for two years, but as volunteers for this duty were numerous, it was always possible to send a replacement for an officer who returned to Canada for Foreign Service Leave at the expiration of his two year term of duty. By the end of hostilities, the original 40 had been replaced two and a half times, so that approximately 100, or nearly one-quarter of all medical officers who entered the Canadian Navy, saw service in ships of the Mother Country. This duty usually took them to the fringes of a far flung Empire, and to places not usually visited by ships of the Canadian Navy. This experience was unique, educational, adventurous, and had a maturing influence upon them.

PROFESSIONAL TRAINING

As medical officers returned to Canada upon completion of their two years abroad in the Royal Navy, it was understood that their service in small ships, with limited clinical experience, gave them a feeling of diffidence in view of all that had been said and published about the rapid advances of medicine during the war. With the co-operation of a number of the larger teaching hospitals these men were granted refresher courses in the form of short-term residencies or internships. The period of such a course was usually three months, and while this may appear rather short for refresher work, it was sufficient to restore confidence and give assurance that these officers would not be under any handicap when they again took up duty at an active base. This liaison with hospitals soon gave rise to a wider application of refresher courses. As already stated, at every naval base and hospital there were specialists in every branch of medicine, but their numbers were so limited that they were overwhelmed with work due to the rapid increase in naval strength. They needed help; even a doctor with minimal specialist training would ease the pressure. Medical officers who showed aptitude in a specialty were selected for further training in a teaching hospital. Such training usually lasted for six months, not long for a specialty but sufficient to greatly increase usefulness. Furthermore, by limiting the courses to short periods it was possible to include greater numbers rather than an apparently favoured few. Courses were given in tropical medicine in Canada, the United States, and in British Guiana, and others were sent to university for an academic year to secure their Diploma in Public Health. By the close of the war, almost 200, or nearly half the total strength of medical officers had received some form of refresher or post-graduate work, spread over 26 hospitals in Canada, the United States, and the United Kingdom. Thus the Navy acquired more highly trained men as the war progressed, and would secure a permanent asset if the officer remained in the permanent force. In the case of those who returned to civilian status this additional training in the Navy was a big step towards, ultimate certification in a specialty and was most helpful in the process of rehabilitation of the officer.

To further stimulate the medical officers' clinical interests, regular staff meetings were held at least once weekly in all naval hospitals. Cases were presented and discussed as is done in all the larger civilian hospitals. Since no undergraduate interns were employed in service hospitals this meant that all medical officers had to work up their own cases for presentation at such meetings.

At large naval bases, such as Halifax and Esquimalt, medical officers were encouraged to join the local medical society, take an active part in the meetings, and read appropriate papers. Frequently papers were presented at larger conferences such as the Canadian Medical Association or to annual meetings of specialist groups. As an outcome of the active part played by naval medical officers at such conferences the papers read were frequently

published in the leading medical journals. In any case they were reproduced in mimeographed form by the office of the Medical Director General, and with additional narratives written by Canadian naval medical officers serving afloat and abroad, were compiled into an R.C.N. *Medical Journal* and distributed to more than 400 medical officers in the service. This stimulus was productive of many very interesting stories of adventure on the high seas and gave an opportunity to display literary talent which had previously been latent. Every article appearing in this journal was original and written by a serving naval medical officer.

CASUALTIES

During the Second World War the naval medical services suffered the following casualties: one nursing officer and nine medical officers died as a result of enemy action; two were prisoners of war; 16 members of the sick berth staff were killed in action.

RECOGNITION

That the operational, professional, and administrative efforts of the medical branch did not go unrewarded is evidenced by the award of the Distinguished Service Cross to three medical officers. One other was made a Commander in the Order of the British Empire; nine were made Officers in the Order; and five granted Membership in the Order. Among the nursing officers, one was made a Member of the Order of the British Empire, three were granted the Royal Red Cross, and five others the Associate Royal Red Cross. In the sick berth branch three were awarded the British Empire Medal. Eleven medical officers and 11 men of the sick berth branch were mentioned in dispatches.

RESULTS

The birth and growth of any organization is fascinating to watch, but its usefulness must be measured by the purpose fulfilled and results attained. The function of the medical branch is no doubt humanitarian in its prime objective, but perhaps its target in wartime goes further, and was tersely described by an American admiral when he said, "We must keep as many men at as many guns as many days as possible". So the concrete results may be shown statistically, but briefly, and with enough accuracy by the use of round figures, as follows:

In the six years of the Second World War there were approximately 150,000 naval personnel admitted to hospital for a total of 1,500,000 days, or an average of 10 days per person. Translated into the total days available for duty for the total naval strength, the time loss through hospitalization

represented nine and one-half days per sailor. From pre-war surveys made in industry it is generally accepted that nine and a half days per person per annum is the normal loss to labour from illness and accidents. Consequently, the comparison shows service medicine in a very favourable light, particularly when it is considered that where people are concentrated, as in naval bases or in confined quarters like ships and barracks, there is a great tendency to infectious epidemics, even though these be only the common cold. Furthermore, the adult who has escaped chicken-pox, measles, and mumps in childhood will almost invariably acquire these diseases once he dons uniform and lives in service environment.

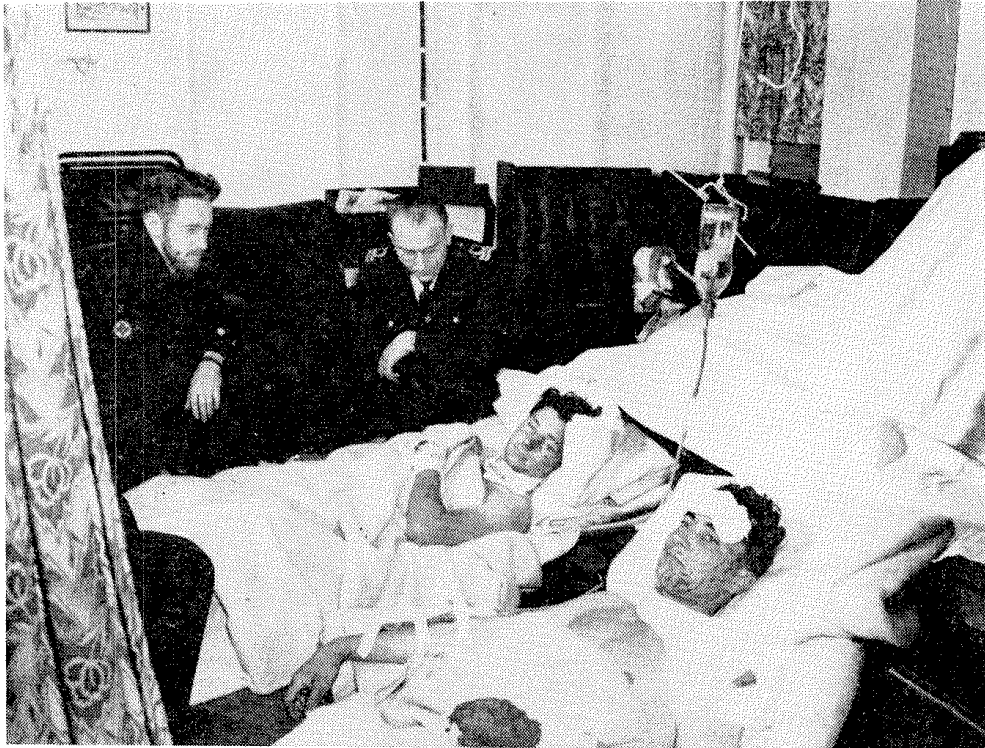
The statistics on mortality are equally illuminating. From 1 September 1939 until 31 December 1945 there were 139 deaths from natural causes among naval personnel. Casualties through sinkings at sea by enemy action, suicides and sudden deaths by motor accidents are omitted as these are conditions beyond the scope of the medical branch to control. The figure quoted covers those receiving attention from the medical officers, either within or without hospital facilities. Some were instantaneous deaths through coronary thrombosis which caused 32 deaths; others were incurable conditions such as carcinomas which caused 14 deaths, and the various forms of meningitis from which 19 died. From 1537 cases of scarlet fever there was one death; from 395 cases of diphtheria there were three deaths.

To draw conclusions from the foregoing, can it not be said that if there were but 139 deaths from 150,000 hospital admissions, the patient had only one chance out of 1100 of dying once he came under the care of the medical branch? This hypothesis based upon factual evidence is a tribute to the skill and devotion of all who served the sick and injured.

CO-ORDINATION

In a letter dated 5 December 1940 the Minister of National Defence for Air indicated his desire that the whole question of medical and hospital services be thoroughly explored "with a view to ensuring that there is the closest degree of co-operation and co-ordination between Medical Branches of the three defence services and the Treatment Branch of the Department of National Health". This suggestion led to the establishment of an Inter-departmental Committee on Hospitalization, composed of the Directors of the Medical Services of the armed forces and the Director of Medical Services of the Department of Pensions and National Health. The duty of this Committee was to plan for the mutual use of all government medical facilities and personnel, as far as this was feasible, and to make every effort to avoid duplication.

Thus it will be seen that the experience gained from the requirements and dictates of war led to a well-organized, economical, and sane handling of medical problems at appropriate levels without any undue competition or rivalry.



MEDICAL AID AT SEA

Aboard H.M.C.S. "Algonquin", a surgeon-lieutenant and his assistant attend soldiers wounded in Normandy on D Day, 6 June 1944.

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CLINICAL ASPECTS

The clinical details of wartime medicine are dealt with at some length in another volume of the Medical History. Generally speaking, there seems to be little difference in therapy and clinical methods as applied to sailors and civilians. On the other hand, circumstances arise to produce clinical aspects in marine warfare which are not encountered in civil life. Of these, one of the most frustrating was immersion foot — a term applied to the condition acquired by shipwrecked people who were exposed for long periods to the wet-cold in life-boats or rafts. Frequently the result was partial or total loss of an extremity or even of life itself. A vast improvement ensued when a refrigeration therapy was evolved to permit a slow restoration of the circulation to the affected parts. Underwater blast was another clinical feature encountered by the shipwrecked who were exposed to depth charge explosions resulting in internal haemorrhage. Seldom could such casualties be rescued in time for effective treatment. Uniform dermatitis became a nuisance feature of marked clinical significance since, while it killed none, it caused discomfort and loss of time to large numbers. Even now not much more is known about its aetiology or physiology.

To these clinical aspects must be added the large number of mental and emotional disturbances encountered among those who had left the security of home and the company of kinfolk, for a sphere of danger in strange places and amidst strange people. Possibly their adjustment to service life was proportionate to the patience, forbearance, and wisdom, not only of the medical officer but of the non-medical officer who had command of their daily routine. It is estimated that 85 per cent of all psychotics encountered in the naval service were restored to a useful service life.

Tropical diseases received considerable emphasis during the Second World War. Suffice it to say that a reasonable number of medical officers received intensive training in tropical diseases to prepare them for any contingency.

It may be repeated that there is little difference between service and civilian therapy or clinical methods; but there is a great difference in the circumstances and locale of their application. The treatment given in a comfortable civilian hospital bed is applicable to the occupant of a bed in a service hospital; and it is equally applicable to a sick sailor in a hammock or cot in a small ship on a turbulent sea, but the latter is not a location of choice! There is ample evidence and testimony to the excellence of the work done among the sick by those in good surroundings; but it is fitting to pay tribute to those who achieved equal results in less favourable circumstances as exemplified in an extract from a case report of an operation performed at sea, which states:

The second mate, having been a medical student many years previously, acted as operative assistant; and the third mate was a fully qualified anaesthetist, having sold patent medicines before the war!

THE DEVELOPMENT OF THE R.C.A.F. MEDICAL BRANCH

During the Second World War medical care for members of the Royal Canadian Air Force was provided on a scale which corresponded with the needs of a greatly expanding force, whose role assumed an importance not previously attained. At the outset medical officers were drawn from the Royal Canadian Army Medical Corps and their activities were co-ordinated by officers at District and National Defence Headquarters. The need for a separate air medical service became apparent early in the war and in 1940 a separate branch was formed. During the next four years this branch developed autonomy in Canada and sent officers overseas to care for the needs of Canadian personnel in the United Kingdom, on the Continent, and further afield. There was close integration with the Royal Air Force medical service in the United Kingdom. The course of events in the development of the new medical service and the special problems which arose in connection with the British Commonwealth Air Training Plan are an important part of Canada's medical history. The special functions relating to the new service and the lessons learned during this early history may be of assistance to the development of medical care for air personnel in the future.

THE FORMATION OF A SEPARATE MEDICAL BRANCH

When the Canadian Air Force was formed shortly after the conclusion of the First World War its medical care was provided through army medical facilities, an arrangement which continued until September 1940. Special R.C.A.M.C. detachments provided medical facilities in military districts where air force squadrons and units were located. After 1938 these detachments constituted the medical component of R.C.A.F. commands, the formation of which marked the administrative separation of air force and army units. Three commands were set up prior to the outbreak of war: Western Air Command in March 1938, and Air Training Command and Eastern Air Command in September of the same year. Air Training Command was redesignated No. 1 Training Command in January 1940 and three new training commands (Nos. 2, 3, and 4) were organized in March and April. A principal medical officer was appointed for each command.

The principal medical officer of a command was the adviser of the A.O.C. on all matters pertaining to the health of air force personnel within the command. He was also the officer commanding the R.C.A.M.C. detachment which was attached to the command. For professional matters the principal medical officer was directly responsible to the D.G.M.S. Station and unit medical officers were the advisers of the commanding officer of the

station or unit to which they were attached; professionally they were responsible to the principal medical officer of their command. In the directorate itself at Army Headquarters in Ottawa was an R.C.A.M.C. officer possessing special technical knowledge of aviation medicine known as the Staff Officer Medical Services (Air). He co-ordinated the activities of the principal medical officers and acted in an advisory capacity to the D.G.M.S. on matters pertaining to aviation medicine.

Auxiliary squadrons had medical officers from the N.P.A.M. just as did army reserve units. Medical care was thus similar to that provided for the Army. But through the attachment of medical officers to the Air Force a small group was developing which was particularly interested in the special medical problems of flight.

From the outbreak of war in September 1939 an increasingly heavy burden was placed on those responsible for the medical care of the Air Force, and it was not long before the feeling grew that while the system in effect had proved satisfactory in peacetime it was inadequate to meet the needs of the wartime Air Force. Medical officers of the N.P.A.M. were called up for duty with their squadrons, but the rapid expansion of the small permanent Air Force, necessitated by the military situation, placed the few available medical officers in a difficult position. At each recruiting centre a medical examining board was instituted; frequently there were not sufficient R.C.A.M.C. officers available and it was necessary to complete the personnel of the board by employing civilian practitioners. As early as 12 September the Chief of the Air Staff commented that the allotment of medical officers and orderlies for duty with the R.C.A.F. was totally inadequate to meet requirements and that a greatly increased number of medical personnel would be needed to meet the coming vast expansion of the force. There was a more serious problem than that of numbers. Special standards pertained to air-crew, and the constitution of medical boards was difficult because few medical officers understood these requirements. Examining boards at recruiting centres followed as best they could R.A.F. standards as laid down in Air Publication 130 (*The Medical Examination for Fitness for Flying*). To meet this problem a school for the instruction of medical officers in the standards to be adopted for aircrew candidates was established in Ottawa in March 1940.* The course, of one month's duration, was devoted to the explanation of these standards and to instruction in some of the basic medical problems relating to flight.

The difficulties attendant upon the medical examination of recruits and the realization that the standards to be applied were distinct from those of the Army were factors in the growing awareness that a separate air force medical service was needed. A number of other factors contributed to the growth of this feeling throughout the early part of 1940. One of these stemmed from the fact that four of the governments of the Commonwealth had

* See Chapter 24, pp. 453-4.

decided in December 1939 to institute a programme for the training of aircrew in Canada; this was known as the British Commonwealth Air Training Plan.* As medical care of the thousands who were to pass through this training programme was to be largely a Canadian responsibility, the burden laid upon the medical officers attached to the R.C.A.F. would be increased tremendously. It was felt that this task would be of sufficient scope to warrant the establishment of an independent medical service.

A further factor giving impetus to the desire for a separate medical service was the growth of interest in aviation medicine. In the late thirties Sir Frederick Banting initiated thought among medical research workers about air medical problems, since he believed that the Air Force would play a very important role in the conflict which he felt certain was developing. His actions in this regard eventually led to the formation of the Committee on Aviation Medical Research of the National Research Council.† An awareness was created that there were peculiar air medical problems which in turn fostered a feeling that a special air medical service would be required to resolve them. As the war developed, and air power increased, this feeling grew.

Other contributing factors were the existence of a separate R.A.F. medical service in Britain, as well as that of a naval medical service in Canada. Moreover, there was the factor that under the existing system promotion frequently necessitated the transfer of medical officers serving the R.C.A.F. to army units; it was argued that the special training and experience of these officers in connection with air medical problems would be lost if there were no guarantee that they would be retained to care for members of the Air Force exclusively. Finally, there was the question of esprit de corps; it was felt that if a medical officer wore the same uniform, lived with the squadrons, and became integrated with the force, he could do much better work. The development of high morale was extremely important to the Air Force at this juncture.

The desire for the establishment of the separate service found expression as early as November 1939. Early in that month two officers of the R.C.A.M.C., Major J. W. Tice and Captain G. E. Hall, prepared a report crystallizing a number of the feelings and attitudes outlined above.‡ In addition, the report pointed out that the double administration of the medical service of the Air Force by the R.C.A.M.C. and the R.C.A.F. was inefficient. Much of the correspondence had to pass through both the Army and the Air Force.

* See Chapter 22, pp. 380-1.

† This committee held its first meeting on 27 June 1939. Sir Frederick Banting was its first chairman. It was reorganized as the Associate Committee on Aviation Medical Research in April 1940. *Proceedings of the First Meeting of the Associate Committee on Aviation Medical Research*, Ottawa, 10 June 1940.

‡ Proposals regarding medical needs of the R.C.A.F.. Main Appreciation. HQS 899-112, Vol. 1.

On 6 November 1939 the report was submitted to the principal medical officer of Air Training Command who concurred in the views expressed in it; the Air Officer Commanding forwarded it to the Chief of the Air Staff on 8 November strongly recommending action along the lines indicated. At the same time the A.O.C. suggested that the authors of the report discuss the question with Sir Frederick Banting whose interest in air medical problems was well known. This they did, and the meeting led to a journey to Ottawa to interview the Deputy Minister of National Defence. The Chief of the Air Staff, while deprecating this departure from service procedure, agreed with the aims, and he sent a memorandum to the Minister recommending the formation of a separate medical service in view of the rapid expansion of the force and the further considerable expansion facing it in the Air Training Scheme. He suggested that the service should be similar to that of the R.A.F.

A detailed report on the question was requested by the Acting Deputy Minister at the end of November and on 8 December the reply was forth-coming. It was pointed out that the R.C.A.F. had no criticism to make regarding R.C.A.M.C. personnel who had worked in harmony with the service, but that the institution of a separate medical branch was necessary. After setting forth the disadvantages of the existing system and the advantages of the proposed new one, the memorandum predicted that there would be a reduction in costs because medical personnel could devote their entire time to selecting air force candidates and thereby weed out many unsuitable applicants before they commenced training or in the early stages.

When no action had been taken a month later the Air Member for Personnel sent a memorandum to the Deputy Minister requesting that authority be granted to proceed with the organization and establishment of the proposed service. But on 30 January the Deputy Minister informed the Chief of the Air Staff that the suggestion had not commended itself to the Government, although no final decision had been reached. The arguments advanced against the proposal, he continued, were that there would be a duplication of headquarters and supply organizations, and that there would be increased costs. Moreover, the question was raised as to whether research in aviation medicine was sufficiently important to justify the separation.

Three weeks later the Chief of the Air Staff sent a further memorandum to the Deputy Minister answering the objections raised by the Government. There would be no duplication of headquarters as there was already a separate organization within the D.G.M.S.'s office for the administration of air force medical matters. As for the supply organization, it was the intention of the Air Force to continue to use the existing Central Medical Stores. The increased costs he thought would be negligible, as the same number of medical officers and other ranks would be employed. Finally, he stressed the importance of aviation medical research, and drew attention to some of the problems in this field such as oxygen-want at high altitudes,

the problem of blacking-out, and that of preventing the onset of deafness, stating that only medical men constantly associated with flying personnel could carry out this work. A separate memorandum on the subject of cost was forwarded to the Deputy Minister in April. This showed that there would be only a very slight increase in annual expenditure. There would be an initial cost of some \$18,000 for uniform allowance and uniforms for R.C.A.M.C. personnel transferring to the R.C.A.F. This could be eliminated by allowing the personnel in question to continue to wear their army uniform, an arrangement which was not considered desirable and which was only suggested in the event that the expenditure indicated might be considered a barrier to the formation of a separate medical service.

No action had been taken by the end of May, and a further memorandum was then sent requesting an early decision on the subject. This met with the same fate. Almost three months more were to pass, during which the expanding medical needs of the Air Force and of the Commonwealth Training Plan demonstrated anew the need for the proposed separate service, before the necessary approval was given. What seems finally to have turned the scales in favour of the establishment of a separate service was the support given this proposal by the Chief Medical Officer of the Canadian National Railways, Dr. John McCombe, who through practical experience was conversant with air medical requirements. On 17 July the C.A.S. forwarded to the Deputy Minister a memorandum on the subject prepared by McCombe.* This stressed particularly the importance of the medical examination of aircrew candidates, and indicated that this was of such a nature, and required the use of certain equipment, that specially trained physicians were needed. It was also stated that misunderstanding was developing between the officers of the R.C.A.M.C. and those assigned to duty with the Air Force, and that the Air Training Plan would suffer if a separate service were not created.

On 15 August the Minister gave his approval to the proposal, and the final authorization came with the passing of an Order in Council on 13 September 1940.† The difficulties of the existing arrangement and arguments advanced for a separate service specifically cited in the order were: (1) while R.C.A.M.C. personnel were attached to the R.C.A.F. for discipline, pay and rations, the fact that they belonged to a different service inevitably caused complications, particularly with regard to discipline and the supply of personal equipment; (2) promotions and postings had to be effected having regard to the R.C.A.M.C. as a whole, thereby endangering the continuity of service with the Air Force; (3) headquarters organization was complicated because two separate headquarters were involved; (4) activities in aviation medical research could be more effectively fostered by a separate

* *Memorandum in regard to the changes in medical organization necessary to meet the requirements of the Empire Air Training Scheme in Canada*, 8 July 1940. HQS 899-112, Vol. 1.

† P.C. 4437, 13 September 1940.

service. The order pointed out that the new arrangement would not involve any increased expense and did not mean that there would be any duplication of facilities in the fields of hospitalization or supply.

The organization order setting up the new branch stated that it was to form with effect from 18 September 1940, and that it was to relieve the R.C.A.M.C. of all duties in connection with the R.C.A.F.

The first director of the new medical service was an R.A.F. medical officer, Group Captain (later Air Commodore) R. W. Ryan, who had been in Canada since February 1940. He had been sent in response to a request of the R.C.A.F. that a senior medical officer be loaned from the R.A.F. in view of the proposal to organize an R.C.A.F. medical branch; it had been anticipated that such an officer would also be useful in connection with the Empire Training Scheme. In view of his considerable experience in aviation medicine, he seemed the logical choice to head the new service. His appointment as Acting Director was effective from 20 September 1940.

The first problem of the new service was that of staffing. The Air Force wished to retain the services of those R.C.A.M.C. personnel then attached to it as a nucleus of the R.C.A.F. medical branch. They were given the choice of remaining in the R.C.A.M.C. or becoming members of the new service. It was agreed that personnel would be granted equivalent rank in the Air Force to that which they held in the Army at the time of transfer, with rates of pay for the most part equivalent to those in the R.C.A.M.C.; in no case would the pay be less. No assurance could be given to those who were members of the Permanent Active Militia as to permanence of service, since the medical branch had not been established on a permanent basis. Although it was hoped that it would be made permanent, efforts to effect this were to no avail. Those who had built up a pension fund of any size could not afford to forego it, and a few officers with experience in air medical problems were lost to the new branch. This did not affect the majority, however, and 202 medical officers transferred. The branch began to operate after 16 November, the effective date of the transfer of most of the medical officers. The appointment of officers directly to the Air Force began early in 1941.

COMMAND MEDICAL ARRANGEMENTS

The transition from Army to Air Force was easily effected in view of the fact that those who staffed the new branch, and particularly those who filled the senior positions in it, had, with few exceptions, themselves created the organization that was now entirely an R.C.A.F. responsibility. A great deal had already been accomplished. In the year that had elapsed since the declaration of war the medical organization had been well established and the small nucleus of medical personnel serving the R.C.A.F. had expanded enormously. Medical organization within the commands had taken shape, and a number of small station hospitals had been built on the numerous stations which had sprung up across the country.

Command and Station Medical Organization

A principal medical officer was appointed for each command; he was the responsible adviser of the air officer commanding on all matters affecting the health and physical efficiency of personnel in the command. It was his duty to ensure the proper functioning of medical services to all units within the command; this he accomplished by means of periodic inspections and by correspondence, reports, and returns. He had direct access to headquarters in Ottawa only on professional matters.

Medical establishments at command headquarters varied slightly; in addition to the principal medical officer, the typical medical staff consisted of a deputy principal medical officer, a command hygiene officer, and, after 1942, a venereal disease control officer, together with a small staff of N.C.Os. and medical clerks. A wide variety of duties came within the scope of the medical staff. It was concerned with all aspects of preventive and clinical medicine, clinical investigation, the supply of medical stores and equipment, the direction of hospital design, the maintenance of medical statistics, and the procurement and training of personnel to carry on the work.

Training commands were divided into schools, stations, and other units. The senior medical officer at each of these was responsible for advising the commanding Officer on the maintenance of the health and physical efficiency of personnel of the unit, for the prevention of disease, and for the treatment of the sick and injured. He and his staff were thus involved in activities ranging from the holding of sick parades and the care of medical and surgical cases to the preparation of reports and returns.

The flying schools varied a great deal in size and function and the medical establishment correspondingly reflected the scope of the work to be undertaken. There were usually two or three medical officers at most flying schools, but at initial training schools the establishment was larger in view of the additional medical responsibility at this stage of aircrew training and, in the case of two of them, because of the research activities carried on there. Medical officers were needed to staff the medical selection boards, of which there was one at each I.T.S., and the two clinical investigation units located at Nos. 1 and 2 I.T.S.*

At the ancillary units, too, establishments varied with the unit's strength and its activities. Recruiting centres were staffed according to the flow of recruits from the area: at one time, February 1943, 80 medical officers (approximately 14 per cent of the number in Canada) were engaged in work at 16 of these throughout the country. Large medical staffs were also needed at the manning depots and larger units such as the Technical Training School at St. Thomas and the R.C.A.F. station at Trenton.

Medical arrangements similar to those in the four training commands prevailed in Eastern and Western Air Commands, which were operational

* For an account of the medical selection boards, see Chapter 24, pp. 448-50.

in function. These commands were divided into groups, squadrons, and stations, each of which had medical personnel. Medical officers frequently flew with the squadrons on operational missions in order to gain first-hand experience of the problems of aircrew in such circumstances. This practice was of direct assistance in the development of aircrew personal equipment.

Hospital Programme

Care of the trainees of the B.C.A.T.P. necessitated a programme of hospital construction. This was undertaken soon after the plan came into effect and ultimately the principal R.C.A.F. units were provided with hospital facilities. In locations where existing buildings were taken over, the station hospitals were in barracks, especially adapted and provided with basic hospital equipment. But the vast majority were on new stations and were standard hospitals of appropriate size and good quality, designed for the purpose, and built under the authority of the Wartime Committee on Hospitalization.

There were 100 of these hospitals, some of which were, in effect, station sick quarters, in Canada and Newfoundland in November 1944, and their combined bed capacity was 5383. Bed capacities ranged from as low as three and four in sick quarters on the small stations to 150 and 200 in the hospitals on the larger stations. The hospital at the Technical Training School, St. Thomas, reached a bed capacity of 700 late in 1944. More than half of the station hospitals were provided with special dietary service, but only one third were equipped to do surgery and this mostly of a minor nature; approximately 42 had x-ray facilities.

Establishments varied according to bed capacity. The smallest station hospitals had one or two medical officers, and units of 150 and 200 beds were provided with 8 and 11 medical officers respectively. There was an administrative officer at hospitals of 150 beds or more. Nurses were provided for units of 25 beds or more and in the case of a 200-bed hospital there were 15 nursing sisters and one matron on the establishment. In addition, a varying number of other rank personnel were called for. A unit of 35 beds had medical clerks (general, stenographic, and supervisory), cooks (if the unit were dieted), hospital assistants, a pharmacist, and a radiographer (if the unit had x-ray equipment). The larger hospitals, in addition to having a greater number of personnel in each of these trades, were also provided with laboratory assistants, masseurs, and wardmasters.

In the first years of the war the R.C.A.F. restricted its activities chiefly to the immediate and minor medical necessities of personnel which could be provided at station hospitals, and more difficult and serious cases than could be cared for at these were referred to D.P. & N.H. hospitals in the vicinity. This was done largely in the interests of economy, the D.P. & N.H. having in operation a complete medical service — specialists, hospitals, and laboratories — throughout the country. When, in 1943, it was decided for a

number of reasons that the R.C.A.F. medical branch would have a specialist professional organization centred in medical boards in each of the commands,* it was realized that it would be necessary to provide hospital facilities where the treatment recommended by the specialists could be carried out. The D.P. & N.H. was willing to put certain of its hospital and laboratory facilities at the disposal of the medical branch in order that it could assume responsibility for the treatment of R.C.A.F. personnel. An experiment along these lines, with the R.C.A.F. medical branch assuming full professional control of its personnel through the appointment of consultants and using D.P. & N.H. hospital facilities, was conducted in the spring of 1943 in No. 2 Training Command when the R.C.A.F. took over 150 beds at the D.P. & N.H. Deer Lodge Hospital, Winnipeg, and itself provided the medical and other necessary staff.†

In October 1943 D.M.S. (Air) prepared submissions for the establishments of the command medical board hospitals, as they were initially known. In some cases existing R.C.A.F. hospitals were to be used. Proposed changes in the establishments of these and proposed new ones for D.P. & N.H. hospitals were reached after considering (1) the amount of work the specialists of the command boards could undertake in the hospital in addition to their other command duties; (2) the provision where necessary of certain trained personnel essential to the running of a large hospital, e.g., anaesthetist; (3) the number of R.C.A.F. personnel required in D.P. & N.H. hospitals to replenish the deficiencies in existing staff in order to assure adequate treatment of R.C.A.F. patients. In No. 1 Training Command it was proposed to use 200 beds of Christie Street Hospital as the command medical board hospital. The arrangement here between the R.C.A.F. and D.P. & N.H. was solely one concerning personnel. D.M.S. (Air) pointed out to the Air Member for Personnel that the hospital was a D.P. & N.H. one:

. . . it is nor proposed that the R.C.A.F. assume material or financial responsibility for the sections of the hospital used by the R.C.A.F. It has been agreed that R.C.A.F. patients will be grouped together in this hospital wherever possible, and by this means there will be wards which are to be known as R.C.A.F. wards, but in order to facilitate the proper working of this hospital, it is desirable to place patients with certain types of disease in areas of the hospital designated for this purpose.‡

In No. 2 Training Command the R.C.A.F. was already operating a 150-bed hospital within the D.P. & N.H. Deer Lodge Hospital, and it was proposed that this arrangement be continued. The command medical board hospital in No. 3 Training Command was to be the station hospital at No. 5 Manning Depot, Lachine, Quebec. This was a 100-bed unit, but D.M.S. (Air) noted that a month previously approval had been given by the Wartime Committee on Hospitalization to increase the bed capacity to 175. In No. 4

* See Chapter 24, pp. 450-453.

† See Chapter 24, pp. 451.

‡ D.M.S. (Air) to A.M.P., 11 October 1943. HQ 870-1-45.

Training Command the R.C.A.F. was building two 100-bed hospitals in Calgary (at No. 2 Wireless School and at No. 10 Repair Depot) and it was pointed out that the accommodation at these could be used for certain cases referred to the command medical board. Difficult cases could be admitted to the D.P. & N.H. Colonel Belcher Hospital in Calgary, which was to open within a few months, for diagnosis and treatment.

In Eastern Air Command it was recommended that the hospital at the R.C.A.F. station at Dartmouth be used as the command medical board hospital. The Wartime Committee on Hospitalization had approved an increase in the bed capacity of this unit from 150 to 200. Finally, for Western Air Command, D.M.S. (Air) proposed that hospitalization be provided by the 75-bed station hospital at No. 3 Repair Depot, Vancouver, and that serious cases be sent to the D.P. & N.H. Shaughnessy Hospital where diagnostic and operative facilities were available. These proposals were approved by the Minister on 19 November, and the new units were established before the end of the month.

There was generally a smaller establishment than for a station hospital of comparable size as the medical officers on the associated command medical board carried out some functions at the hospital, and the president of the board was almost invariably the senior medical officer of the hospital. Moreover, at Christie Street and Deer Lodge Hospitals the presence of a large civilian staff obviated the need for the usual complement of R.C.A.F. personnel. At Christie Street, for example, no nursing sisters were required.

Ultimately the number of beds used by the R.C.A.F. at Christie Street rose to 250, and 80 beds were operated at the Colonel Belcher Hospital in Calgary. The total R.C.A.F. hospital bed capacity (not including convalescent hospitals) in November 1944 was thus 5863, of which 5383 were in station hospitals (including those at Lachine, Dartmouth, and Vancouver which were considered command hospitals) and 480 at Christie Street, Deer Lodge, and Colonel Belcher Hospitals.

Late in 1944, with the consolidation of Nos. 2 and 4 Training Commands and the prospect of a further reduction in the number of commands, a change in the designation of the hospitals proved necessary. A term was sought that would be "sufficiently descriptive of their location and yet not restrictive of their function" which, it was realized, might change from time to time.* It was decided to call the units "Regional Medical Board Hospitals", and an A.F.R.O. embodying the change in terminology, with effect from 1 December 1944, was published on 5 January 1945.

The command hospital arrangements proved satisfactory. When certain treatment not available in station hospitals was required the facilities of the command medical board hospital were used and gradually all important medical and surgical treatment came to be carried out at these centres. Air

* D.M.S. (Air) to A.M.P., 26 September 1944, HQ 870-1-45.

force personnel were thus given treatment even for serious illnesses and injuries by their own service medical officers, and the latter gained experience not possible in the smaller hospitals.

Beginning in 1943 the R.C.A.F. operated a number of convalescent hospitals, the work of which is discussed in Volume II.* By the end of the war the number of these had risen to 11. They were located as far apart as St. Andrews-by-the-sea, N.B., and Victoria, B.C., and had a total bed capacity of more than 600.

THE MEDICAL BRANCH AND THE WOMEN'S DIVISION

The decision to enlist women in the R.C.A.F., taken as a result of the developing manpower shortage, confronted the branch with a series of new medical problems. The formation of the Canadian Women's Auxiliary Air Force was authorized by Order in Council on 2 July 1941 ; it was redesignated Royal Canadian Air Force (Women's Division) in February of the following year.

It was decided to appoint female medical officers as the first step in meeting the new situation. The R.C.A.F. was the first of the three services to take in women doctors; the latter held women's division rank titles but in all other respects were commissioned in the medical branch in the same way as men. They were not a part of the Women's Division. The first woman medical officer, Dr. Jean Davey, was appointed on 18 August 1941 and was retained on the staff of the directorate at headquarters; 13 other women doctors were commissioned as the need arose in the following two years, and most of them were employed in work relating only to women's division personnel. One of the female medical officers was a pathologist and bacteriologist, one was a radiologist, another was a hygiene officer; all of these officers were employed in their specialties. Similarly, a fourth, a psychiatrist, did consultant psychiatric work for women personnel. All these officers worked closely with the administrative staffs of the Women's Division and gave advice and guidance on matters concerning the welfare of airwomen.

The recruitment of women, which began in September 1941, directly concerned the medical branch whose officers examined more than 23,000 women recruits during the period, slightly over three years, in which women were enlisted. Arrangements were made to provide separate accommodation for women applicants at each recruiting centre. At two of these, in Toronto and Vancouver, where the amount of work was sufficiently large to warrant it, women medical officers carried out the examination of women. The special standards to be applied in the medical examination of women recruits were drawn up and circulated early in September to the medical officers in

* FEASBY, W. R., *Official History of the Canadian Medical Services 1939-1945*, Vol. II, pp. 173-4.

charge at recruiting centres. The standards were high at first, but when the need for women increased they were modified by lowering visual standards and readjusting weight requirements.

After enlistment, airwomen came under exactly the same medical arrangements as did men. They were posted to a special manning depot - originally No. 6 in Toronto but later No. 7, Rockcliffe — where they received their basic training. The medical programme for women at manning depot was the same as that for men except that it was carried out entirely by women medical officers. The airwomen were quarantined for ten days and carefully examined for communicable diseases. They received the same inoculations given airmen, and they were vaccinated against smallpox and given three doses of T.A.B.T. They were given Schick and Dick tests, and those susceptible received diphtheria toxoid and scarlet fever toxin for purposes of immunization. Lectures were given to them on medical organization and procedure, general principals of health and hygiene, mental hygiene, sex hygiene, and venereal disease and pregnancy. Instructional films on nutrition and venereal disease were shown to women recruits. On posting to station duties, they became the responsibility of the station medical staff for their care. Efforts were made on stations to follow-up the instruction given at manning depot in sex hygiene and related problems.

There were a number of special problems attendant upon the service of women on which the medical branch was consulted. On stations where women were located, existing hospital facilities had to be modified; special general and isolation accommodation and separate ablution facilities were required. Structural alterations and additions were made to station hospitals in order to provide adequate accommodation for the care of airwomen. Two of the R.C.A.F. station hospitals were built for women personnel. These were the 25-bed unit at No. 6 Manning Depot (later converted to No. 2 Composite Training School) and the 35-bed unit at No. 7 Manning Depot. Women doctors organized and operated both of these hospitals.

The medical branch was also concerned to see that the barracks were properly heated; in the first winter that the women served the heating arrangements were far from satisfactory. A further responsibility of medical personnel was to train most of the women entering medical trades.*

Equipment problems, too, involved the medical branch. Scales of issue of medical supplies had to be increased because of the larger force, and in addition provision had to be made for adequate sanitary facilities and gynaecological supplies at station hospitals. The wearing of proper clothing was stressed in order to avoid illness. After the first winter steps were taken to provide better protective clothing to airwomen in trades in which it was required to work in exposed places. Winter hats were issued for general station wear. During the second winter the wearing of ear muffs with the new style hats was authorized because of the high incidence of frostbite.

* See Chapter 24, pp. 434-8.

Another equipment problem concerned the design of shoe worn by women personnel. The original shoe had a rigid toe cap similar to that on shoes issued to male personnel. Because of the thin stockings worn by women, the toe cap frequently caused sores, sometimes amounting to deep ulcers, across the toes. This type of shoe was abandoned in favour of one without a toe cap and the new design proved satisfactory. There was also trouble because of the incorrect fitting of shoes. This arose because the equipment sections were understaffed, the other ranks were not adequately trained for this job, and there was often insufficient time allowed for accurate measurement and fitting. The problem was gradually resolved and the number of personnel reporting on sick parade with sore feet was reduced. No hospital uniform was authorized for women personnel. Pyjamas, bedroom slippers, and dressing gowns were issued, but no jackets and skirts were provided for wearing during convalescence and it was felt that this was an unfortunate omission.

A few doctors trained in gynaecology were appointed to the medical branch as surgeons but did gynaecological work. Early in 1942 the D.P. & N.H. agreed to appoint gynaecological consultants in various parts of Canada and to make their services available to members of the Women's Division. The procedure agreed upon when consultation was desired, apart from emergency cases, was that a complete history of the case and reports of physical examinations, with the medical officer's opinion and reasons for requesting a consultation, were to be forwarded to D.M.S. (Air). A further copy was to go to command headquarters. If approved, the directorate was to contact D.M.S., D.P. & N.H., and request the consultation. The unit was then to be notified by the D.P. & N.H. This complex procedure was designed to avoid the difficulties of carrying out examinations in service conditions.

There were few special clinical problems concerning female personnel. Venereal disease did not constitute a serious problem, numerically speaking. * As a rule, women with venereal disease were retained in the service and treated there. They were discharged only if there were other indications to make it advisable. An effort was made to maintain confidential records, and posting to another station was carried out if the medical officer in charge felt it was necessary to help re-establish the airwoman in the service.

Pregnancy was a more important problem in the Women's Division than was venereal disease. Although the incidence was not unduly high, the social implications enhanced the significance attached to this condition. Special regulations were devised, diagnostic facilities were developed, and proper care was provided for the women concerned. Since service could not be continued after a certain period, arrangements for discharge were made. Adequate care was ensured through welfare agencies when necessary. In 1943 the Department of Pensions and National Health was enabled to offer

* FEASBY, W. R., *Official History of the Canadian Medical Services 1939-1945*, Vol. II, pp. 513-14, for statistical data on this subject.

financial assistance and complete medical care to women discharged from the service by reason of pregnancy and who were in necessitous circumstances.* Such care was available in Canada only, and, if overseas, the individual had to be repatriated to be eligible.

Women desiring help were guided by the senior W.D. administrative officer on the station and at the release centre and by the Command Special Services (Welfare) Officers (Women's Division) in making contact with the D.P. & N.H. Medical officers were not directly concerned with this aspect of the problem although satisfactory disposal of some cases involved their co-operation. Every effort was made to maintain contact with women needing help until such time as confinement was over and they were re-established in civilian life.

For the purpose of determining the extent of the problem and the measures of control required, the R.C.A.F. considered as illegitimate any pregnancy in which the woman was not married to the father of the child at the time of conception. In the compilation of civilian statistics, however, illegitimate births are only those in which the woman is single at the time of the *registration* of the birth or married but her husband is admittedly not the father of the child. In making any comparison with civilian experience, this difference must be recognized, and knowledge of the marital status of W.D. personnel at the time of confinement, as learned from follow-up work by women welfare officers, is required.

Case records were maintained on all cases of pregnancy; these were complete after 1942 when policy on this matter became well defined. The data derived from these records show that the incidence of illegitimate pregnancy in the R.C.A.F. (W.D.) was not unduly high and, in so far as an accurate comparison can be made, compared favourably with that for civilians.

In 1943, a typical year, 525 women were boarded out of the service because of pregnancy.† Of these, 48 were pregnant before enlistment and 477 became pregnant after enlistment. Of the latter, 228 were married at the time of conception and 249 were either single or were married but the husband was not the father of the child. Of the 249 cases, 80 were married prior to confinement and there were 14 miscarriages. Therefore, only 155 or 32.5 per cent of the 477 cases of pregnancy occurring after enlistment and reported in 1943 are classified as illegitimate. Even this figure still includes 16 women on whom no follow-up information was obtainable and who probably either miscarried or married since no births are registered under their names.

The 155 illegitimate births represent a crude illegitimate birth rate of 13.9 per 1000 single W.D. personnel; when adjusted to the age-distribution

* These functions were assumed late in 1944 by the Department of Veterans' Affairs.

† Figures are derived from the report R.C.A.F. (*Women's Division*), Appendix "D", Medical Survey R.C.A.F. (W.D.), March 1945. There were also 36 cases of abortion reported during 1943.

of single women age 18-44 years in Canada this rate becomes 12.8 per 1000.* If the 16 doubtful cases are excluded this rate becomes 11.5 per 1000. This figure compares favourably with the estimated civilian rate for 1943 of 11.9 per 1000 single women in the age-group 18-44.†

These figures corroborate the view, held by senior officers of the medical branch most familiar with this question, that the frequency of illegitimate pregnancy among service women personnel during the war was no greater than that among the civilian female population of the same age-group.

THE DIRECTORATE OF MEDICAL SERVICES (AIR)

Directing and co-ordinating the manifold activities of the medical branch was the directorate at A.F.H.Q. in Ottawa. The task of organizing the headquarters medical directorate was undertaken immediately the new branch began to operate in November 1940. The original staff included the Director of Medical Services (Air), who was the executive head of the branch, his deputy (D.D.M.S.) and a small staff. The initial establishment of the directorate was ten officers (nine medical officers and one quartermaster), 13 other ranks and four civilians. As the strength of the Air Force grew, the duties and responsibilities of the branch increased proportionately, and the number of officers carried against the establishment increased throughout 1941, although the establishment for officers rose by only one when, in July 1941, an administrative officer was added to assist the officer in charge of statistics. By the end of the year the officer strength was 15, or four above the establishment.

By this time the directorate was well organized for its task of supervising every phase of air force medical activity. During the first year of its operation, the branch became actively engaged in all aspects of preventive and clinical medicine, research, and the maintenance of records, and the development of an effective medical statistical service, as well as in the fundamentals of the supply of buildings, equipment and stores, and the procurement and training of personnel. This development was reflected in the organization of the directorate, the structure of which is illustrated in Chart I.

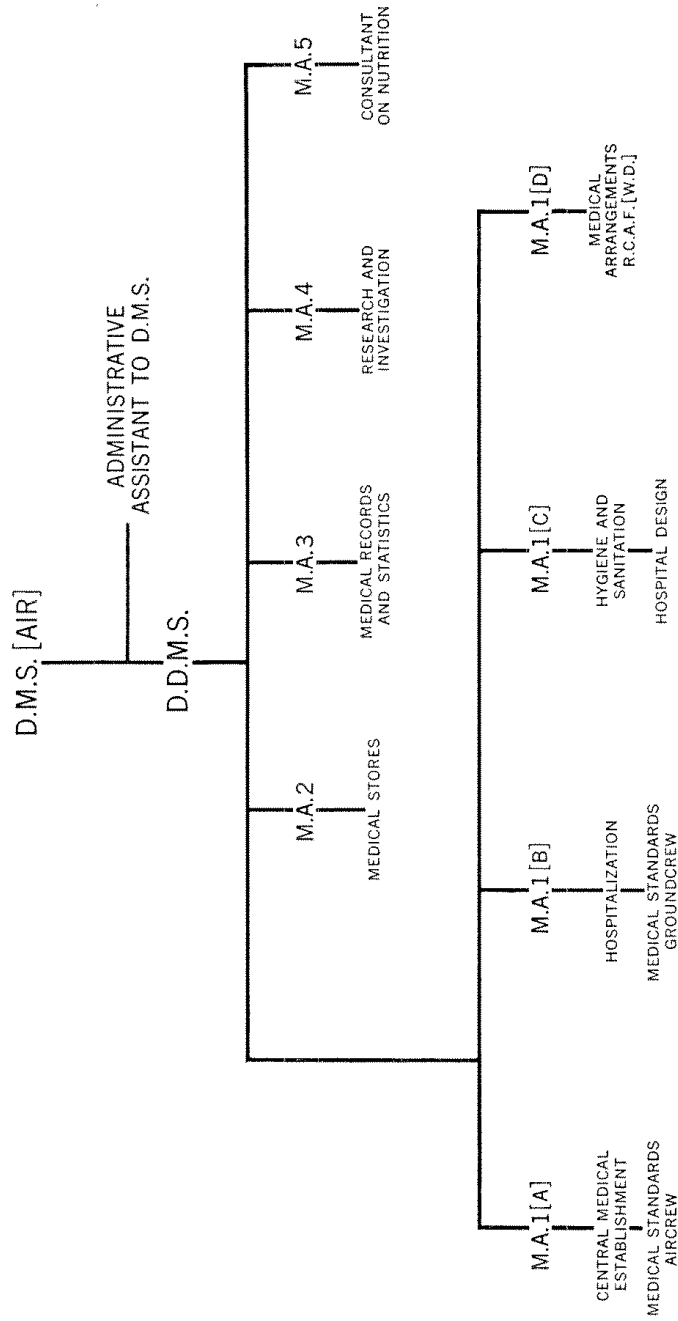
The medical branch was a part of the A.M.P. Division. The A.M.P. represented the medical branch on the Air Council, the governing body of the R.C.A.F. and D.M.S. (Air) was responsible to him for the administration of the medical branch. In this early period the director dealt directly with the nursing and consultant services; He had an administrative assistant whose principal functions were to supervise office administration, report on establishments, and effect liaison with the appropriate air force branches concerning postings, recruiting, and promotions.

* These figures are based on available information on W.D. strength in 1943 by age and marital status.

† Based on the mean number of recorded illegitimate births during the three years 1930-42, adjusted for the trend in the illegitimate birth rate during the war years.

DIRECTORATE OF MEDICAL SERVICES [AIR], AIR FORCE HEADQUARTERS

ORGANIZATION - 1941 TO 1943



There were five sections in the directorate (M.A. 1 - M.A. 5), the first of which was divided into four sub-sections (M.A. 1(a) - M.A. 1(d)). The activities of M.A. 1 personnel were controlled by the deputy director who also supervised the work of the School of Aviation Medicine. M.A. 1(a) handled aircrew medical standards and had administrative control of the various medical standards and had administrative control of the various units forming the central medical establishment. These units dealt principally with the selection of candidates for appointment and enlistment in the various categories, and included recruiting centre medical boards and medical selection boards at initial training schools. M.A. 1(b) dealt chiefly with x-ray services, hospitalization, and medical standards for groundcrew. The main functions of M.A. 1(c) were hygiene and sanitation arrangements, hospital design, and blood grouping. M.A. 1(d) was created to supervise the medical arrangements for women personnel.

M.A. 2 handled the accounting and supply of medical stores, scales of issue, and ration and diet accounting. The important question of medical records and statistics came under the direction of M.A. 3. This section was responsible for the planning, collection, and analysis of all medical returns for R.C.A.F., R.A.F., R.A.A.F., R.N.Z.A.F., and R.C.A.F. (W.D.) personnel, including those dealing with medical boards and examinations. Directives to principal medical officers and to units respecting the use of all medical forms and documents emanated from M.A. 3. An assistant was provided for both M.A. 2 and M.A. 3. Air force medical investigation and research came under M.A. 4. The clinical investigation units were dealt with through this section, which also effected liaison with the United States National Research Council. M.A. 5 was the consultant in nutrition to the R.C.A.F.

With the continued expansion of the R.C.A.F. and the problem of medical care becoming more apparent, further personnel were added to the directorate late in 1942. An additional position was established in M.A. 1(c) in order that a more vigorous attack could be made on the problem of venereal disease in the service. In view of the expanded scope and responsibilities of M.A. 4, the position was raised from wing commander to group captain rank and a medical associate was added to the establishment to assist. Early in 1943 Air Commodore Ryan resigned as Director of Medical Services (Air) and returned to service with the R.A.F. in the United Kingdom. He was succeeded by Group Captain (later Air Commodore) J. W. Tice who held the position of director for the remainder of the war and during the immediate post-war period.

The expansion in the activities of the directorate by the beginning of 1943 was such that a reorganization and a further increase in the establishment were necessary. In the new arrangement the nursing service was represented by a matron who reported directly to D.M.S. (Air). The officer in charge of medical questions relating to the Women's Division now also had

direct access to the director. There were now four consultants: one each in nutrition, otolaryngology, civil aviation, and physiotherapy. Each of these consultants held the rank of honorary wing commander.

There were now two deputy directors, one in charge of administrative matters (D.D.M.S.(A)) and the other in charge of professional ones (D.D.M.S.(P)). In addition to carrying out many of the duties handled by the single deputy under the previous arrangement, D.D.M.S.(A) controlled the training and posting of personnel and was the officer responsible for hospital design and establishments. He was the representative of D.M.S. (Air) on joint bodies such as the Wartime Committee on Hospitalization and the Canadian Medical Procurement and Assignment Board. M.A. 1, M.A. 2, and M.A. 3 reported to D.D.M.S. (A). M.A. 1, which was no longer subdivided and most of whose functions were re-allotted, handled hygiene and sanitation, formerly the concern of M.A. 1(c). M.A. 2 anti M.A. 3 retained the same functions as under the previous organization. M.A. 4 was, as before, directly responsible to D.M.S. (Air).

D.D.M.S. (P) had control of M.A. 5, M.A. 6, and M.A. 7 personnel, as well as the central medical establishment and most of the consultant services. M.A. 5 was concerned with nutrition arrangements in the service. Medical selection and re-selection was the function of M.A. 6, who was assisted by three officers. M.A. 6(a) dealt with aircrew selection, M.A. 6(b) with groundcrew, and M.A. 6(c) with medical boards. Among the duties of M.A. 7 were liaison with the sister medical services and the D.P. & N.H., the handling of certain returns, and policy with regard to x-ray and laboratory procedures. The changes effected as a result of the reorganization of 1943 are illustrated in Chart II.

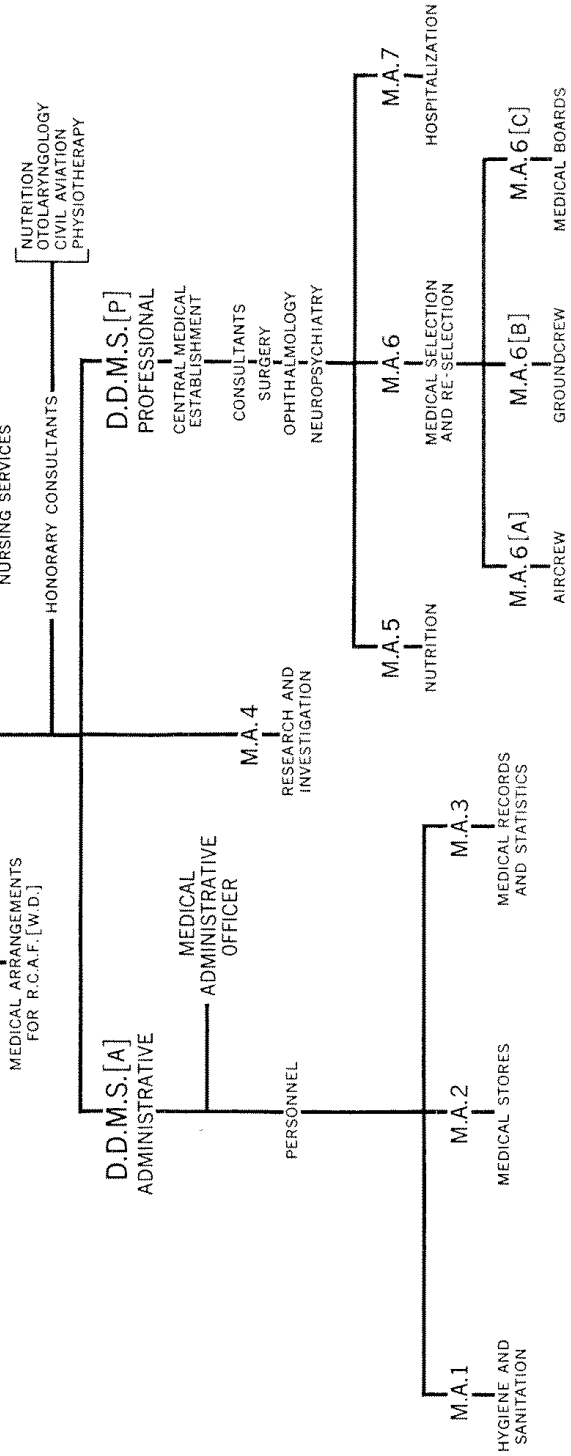
Additional personnel were needed to help carry out the duties reflected in the reorganization of the directorate. Accordingly, in May 1943, approval was obtained to increase the establishment by six officers, 15 other ranks and six civilians, thereby giving the directorate 24 officers, 25 other ranks, and 23 civilians. Some of the new positions were filled immediately. A further addition of one medical administrative officer and one other rank took place in October 1943. The medical administrative officer was appointed to direct the development of the educational phase of the duty-fitness programme. He was attached to the central medical establishment and was therefore responsible to D.D.M.S.(P).

The organization as outlined in Chart II was not changed essentially until 1945. The designation of all headquarters' establishments was altered in that year for reasons of standardization. The resulting changes are reflected in Chart III, the final organization of the wartime directorate. Among the more important additions since the reorganization of 1943 were consultants in anaesthesia and radiology and sections to direct the planning of Phase II (the Pacific War) and the convalescent programme.

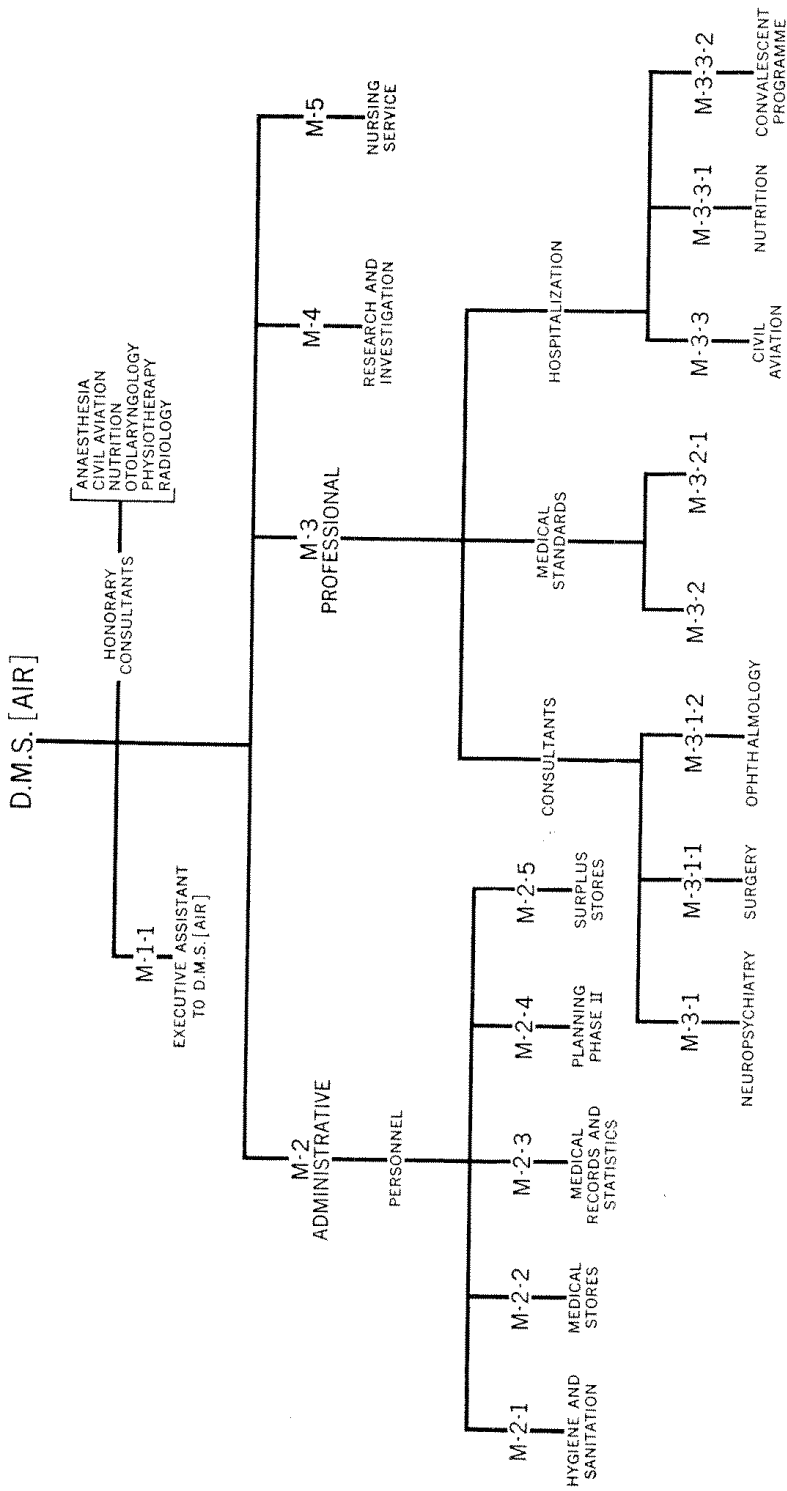
DIRECTORATE OF MEDICAL SERVICES [AIR], AIR FORCE HEADQUARTERS

RE-ORGANIZATION - 1943

D.M.S. [AIR]



DIRECTORATE OF MEDICAL SERVICES [AIR], AIR FORCE HEADQUARTERS
RE-DESIGNATION TO MEET AIR FORCE RECORD REQUIREMENTS-1945



MEDICAL ARRANGEMENTS OVERSEAS**Organization in the United Kingdom**

In addition to the arrangements for the medical care and treatment of K.C.A.F. personnel at home, provision had to be made at an early date for those overseas. Medical care of all these Canadians was provided through the unit with which they were serving: for Canadian squadrons Canadian medical officers were provided, while Canadians in British units were cared for by the R.A.F. In all, 41 Canadian squadrons served in the United Kingdom during the Second World War; in addition to the personnel manning these squadrons, thousands of Canadians served with the Royal Air Force. Initially, of course, medical care was an army responsibility and when the first R.C.A.F. unit to be dispatched overseas, No. 110 (Army Co-operation) Squadron, sailed from Halifax in February 1940, it was accompanied by a medical complement of one officer and seven other ranks, all R.C.A.M.C. personnel. Once the air force medical branch was formed, it provided the squadron medical personnel. The medical establishment of all operational squadrons (except Army Co-operation) called for three other ranks in addition to one medical officer.

Throughout the war the R.C.A.F. overseas was closely integrated with the R.A.F.; Canadian units were placed under the operational control of the R.A.F. and were included in R.A.F. formations. With few exceptions medical facilities other than those provided for squadrons and stations were therefore rarely an, R.C.A.F. responsibility. The medical officers of stations and squadrons were responsible to the R.A.F. authorities in the formations to which they were attached. As a result, the activities of the medical branch were necessarily limited.

There was one formation which was purely R.C.A.F. and to which Canadian medical personnel were appointed. This was NO. 6 (R.C.A.F.) Group, the first and only Canadian air formation overseas. No. 6 Group was formed on 25 October 1942, with headquarters at Allerton Park, near Knaresborough, Yorkshire, but did not become operational until 1 January 1943. It comprised originally eight squadrons but by the end of the war there were 14. These 14 squadrons were grouped in pairs on stations which were administered ultimately from three bases: Linton-on-Ouse, Leeming, and Middleton St. George, all in Yorkshire. The base organization was adopted to overcome the difficulty of controlling efficiently from a single headquarters as many as 15 airfields. It was to provide a necessary link between group headquarters and stations. Each of the three base stations was provided with three medical officers and a nursing sister, save for Linton-on-Ouse where there were two medical officers. The senior medical officer of a base acted as adviser to the base commander in addition to his medical duties on the station. He was also to exercise supervision of the medical arrangements at the sub-stations, although the direct responsibilities for the latter devolved

upon the medical officer in charge. Linton-on-Ouse had two sub-stations and the other two base stations (Leeming and Middleton St. George) had one each ; on each of these sub-stations there were two medical officers and a nursing sister. Other rank medical personnel on all these stations varied in number from five to 13 depending on the size of the station.

The senior medical officer of the group was located at Group Headquarters, Allerton Park. He was responsible to the medical authorities of the R.A.F. in Bomber Command. He supervised and advised the medical officers and nursing sisters of the three bases and their satellite flying stations, and maintained liaison with all hospitals serving No. 6 Group personnel. After November 1944 he was provided with a deputy. From February 1943 there was a unit medical officer at headquarters and six hospital assistants. No provision was made in the establishment for a nursing sister but in October 1944 one was attached to the unit and remained there until May 1945. The work of the unit medical officer consisted of looking after the M.I.R., the small sick quarters, and the hygiene and sanitation of the station. The station sick quarters, which was completed and occupied in August 1943, operated as a unit separate from the senior medical officer and his staff. As this was a non-flying station there were no problems in aviation medicine, and only on rare occasions were the medical personnel called upon to attend crashes which had occurred in the vicinity. Hospitalization for personnel of No. 6 Group was provided principally at the R.A.F. general hospitals at Northallerton, Yorkshire, and Rauceby, Lincolnshire, the E.M.S. hospital at Harrogate, Yorkshire, the York Military Hospital, and Harewood House Convalescent Hospital. Many patients were referred to Canadian general hospitals (Army), none of which, however, were in the region of the group stations. *

At the time of the arrival of the first squadron overseas, in February 1940, a beginning was made towards the establishment of a small medical headquarters in London. In that month an R.C.A.M.C. officer was posted to R.C.A.F. Overseas Headquarters as principal medical officer of the R.C.A.F. in the United Kingdom. He was made responsible to the officer commanding Overseas Headquarters for administration. He was responsible for close liaison on medical matters with the senior medical officer of the Canadian Army in London and with R.A.F. medical authorities, and was to keep the medical authorities in Canada informed on all medical matters pertaining to the R.C.A.F.

In June 1940 the principal medical officer was provided with a deputy, and in the following month a detachment similar to those in the commands in Canada was formed. It had an establishment of two officers and seven other ranks. Following the formation of a separate air force medical service, the position of principal medical officer was turned over to an R.C.A.F. medical officer. The R.C.A.M.C. detachment was dissolved in March 1941

* See map *The United Kingdom, 1939-1946*, after p. 112

when its personnel either transferred to the R.C.A.F. medical branch or were posted to Canadian Army units in the United Kingdom. At the same time an R.C.A.F. deputy principal medical officer was provided.

With the duties of the R.C.A.F. medical authorities considerably restricted as a result of the placing of Canadian units in R.A.F. formations, and the attendant responsibility of R.C.A.F. medical officers to R.A.F. medical authorities, the functions of the small medical headquarters were necessarily limited. It had little direct authority or responsibility for the care of Canadians or for medical organization overseas. Its principal function was to maintain liaison between the branch in Canada and the R.A.F. medical service.

General supervisory functions in the fields of communicable diseases and hygiene were maintained. An effort was made by the headquarters staff to see that members of the R.C.A.F. were provided with the best care possible in the various hospitals to which they were sent, and to arrange their transfer from one of these hospitals to another when such action was required. An R.C.A.F. medical officer visited personnel in hospitals, other than those of the R.C.A.M.C., at frequent intervals.

Among the more important duties of headquarters was the handling of medical documentation and statistics. It had been decided that the only workable plan in this regard was to adopt the R.A.F. system, modified where necessary to suit Canadian requirements. R.A.F. medical forms were passed to R.C.A.F. headquarters where the relevant information on them was transcribed to R.C.A.F. forms for transmission to Ottawa. Initially, the deputy principal medical officer was charged with this task, but when, late in 1941, the pressure of statistical work became great a statistical officer was provided to handle it.

As the strength of the R.C.A.F. overseas increased, the size of the medical headquarters grew. Prior to November 1941 there were only two medical officers at headquarters, the principal medical officer and his deputy. In that month the medical statistics officer was added, and in December an officer was posted to the staff for medical administrative duties. To further the policy of supervision of as many R.C.A.F. cases in hospitals as possible, two additional medical officers were taken on strength in May 1942 to act as medical liaison officers. In August 1942 the small headquarters was made a directorate, and the principal medical officer became the Director of Medical Services, R.C.A.F. Overseas. An establishment of 11 medical officers and three nursing sisters was approved for the new directorate; this represented its peak establishment. Some personnel who worked elsewhere, as at East Grinstead or Warrington, were carried on the establishment of headquarters.

From time to time medical officers sent to the United Kingdom on special liaison or research duties were attached to the directorate. One of the disabilities of which the branch in Canada was very conscious was the sense of remoteness from the medical problems of operational flying. To remedy

this deficiency and to apply the lessons learned to the task of training under the B.C.A.T.P., a series of liaison officers was attached to operational formations or to related research establishments in the United Kingdom and even further afield. Their reports and observations were most helpful in evaluating the importance of a wide variety of problems and procedures in Canada where the R.C.A.F. was carrying out the essential task of training thousands of recruits.

Hospital Policy in the United Kingdom

In view of the wide dispersal of R.C.A.F. personnel in R.A.F. formations throughout the United Kingdom, it was decided that the force would not advocate a separate R.C.A.F. hospital service overseas, although the formation of one or more purely R.C.A.F. hospitals in the United Kingdom was under consideration frequently during the war. There were, of course, small sick quarters at all R.C.A.F. stations where those with minor ailments were treated. But serious cases and all those requiring lengthy treatment were hospitalized in E.M.S., R.A.F., R.A.M.C., and R.C.A.M.C. installations, wherever possible in the latter so that they would be treated by Canadians.

Serious consideration was given in the autumn of 1942 to the establishment of an R.C.A.F. hospital for No. 6 Group. It was felt that with the formation of this group, consisting initially of eight squadrons, there would be a sufficient concentration of Canadian air force personnel in one area to justify this. Available hospital accommodation in the area of No. 6 Group was explored, but the only suitable site, an E.M.S. hospital at Northallerton, Yorkshire, could not be secured as the R.A.F. had already made arrangements to take it over. When, early in 1944, the Air Ministry suggested that the R.C.A.F. might take over this hospital, the R.C.A.F. authorities were no longer interested and the project was dropped. In view of its strategic location in the centre of No. 6 Group area, increasing numbers of R.C.A.F. personnel were treated at the unit and it was felt that although the original plan to assume control of it had been abandoned, some contribution of Canadian medical and nursing personnel should be made to the R.A.F. establishment. Such a policy was supported by the A.O.C.-in-C., R.C.A.F. Overseas, and three medical officers, six nursing sisters, and one matron were posted to Northallerton. Instruction was given to several other medical officers who were attached to the hospital in a supernumerary capacity. An idea of the volume of work created by the presence of R.C.A.F. patients is given from the fact that as many as 155 were hospitalized in one month: in addition, there were many more attending as out-patients, and a large number of surgical operations were performed on Canadians. Close co-operation was received from the whole R.A.F. staff.

Although no R.C.A.F. hospital was established in the United Kingdom, there were two centres where the force maintained unusually large station sick quarters involving a larger medical staff and greater medical facilities

than those usually available on stations. At both Bournemouth, Hampshire, and Warrington, Lancashire, the sick quarters were larger than those at other stations because of the volume of personnel passing through them, and considerable numbers of medical officers, nursing sisters, and other rank personnel were required.

A Canadian personnel reception centre opened in Bournemouth in June 1941 as a general reception centre for all personnel graduating from the B.C.A.T.P. At first the station was organized as an R.A.F. unit, but after October 1943 the Canadian section was made separate and was known as No. 3 (R.C.A.F.) P.R.C. The unit remained in Bournemouth for the rest of the war, except for a four-month period in 1944 when, since it was in an area to and from which normal movement of personnel was banned for several months prior to D Day, it operated at the R.A.F. station at Innsworth, Gloucestershire. A separate wing was set up in 1944 to accommodate R.C.A.F. personnel from the Far East, the Mediterranean theatre, and North-West Europe. In September 1945 Bournemouth was used as a holding unit for personnel awaiting repatriation.

For the purposes of equipment the station sick quarters at Bournemouth was considered an SO-bed hospital although the accommodation of this number could only be accomplished by crowding. Drafts of personnel coming to the station varied from a few hundred to several thousand at one time, and the volume of work for the medical personnel was therefore considerable. The medical staff, as at any other unit, was primarily concerned with the maintenance of the health of the personnel and their care when they became ill or injured. In addition to the task of running the station sick quarters, medical personnel carried out F.F.I. (free from infection) examination on all incoming drafts, brought medical documents and inoculations up to date, and gave indoctrination lectures on personal hygiene, venereal disease, and aviation medical subjects such as the use of oxygen and the effects of centrifugal force on the human body. Medical personnel took their share of maintaining morale among aircrew, many of whom were destined to remain many months at the reception centre.

There were two sections of this station in which medical personnel had a more indirect interest. The first was an aircrew selection board where all incoming aircrew were interviewed prior to being posted, and where a decision was reached regarding the particular type of operation for which they would be best suited. The decision largely rested on operational demand, but was in some instances influenced by the desire of the personnel concerned. Factors of a medical nature, such as height, age, night vision score, results of the decompression chamber test, and others, had often to be considered. Secondly, there was a night vision testing unit where aircrew whose night vision had not been tested prior to embarkation in Canada or had not been recorded on their documents were tested. Later, individuals who required it were given night vision training.

The other station where a large sick quarters was maintained was the Repatriation Depot at Warrington, Lancashire. This station was formed in response to the need for a centre for Canadian personnel awaiting repatriation. The repatriation of medically unfit personnel had constituted a problem for the medical authorities since the early days of the war; personnel often remained as long as six to nine months in hospitals, convalescent centres or on stations before being repatriated and physical and mental health was jeopardized by these long delays. Formation of the Repatriation Depot at Warrington, which was also meant to handle personnel being repatriated for non-medical reasons, was intended to solve this problem.

This station opened in September 1942 and operated in Warrington until June 1945 when it was moved to Torquay, Devon. Between Warrington and one of the two satellites it later acquired, station sick quarters accommodation was available for 40 persons. At Torquay there was room for 58. As at Bournemouth, surgical cases and seriously ill medical cases were transferred to Canadian Army, R.A.F., or E.M.S. hospitals.

As its name implies the unit was used for the repatriation of R.C.A.F. personnel to Canada. Cases who were eligible for repatriation varied in nature; there were medical repatriations, normal repatriations, disciplinary repatriations, volunteers for the Pacific, and others. Work at the unit consisted of routine station sick quarters procedure, sick parades, ward rounds, F.F.T. parades, and venereal disease lectures to all incoming drafts. Prior to the opening of the medical board in London, in May 1944, an R.C.A.F. board functioned at Warrington, and transients who were posted to the repatriation depot as medical cases and who had not already been medically boarded appeared before the board here. The board was established soon after the opening of the depot. It was staffed by a president, a neuropsychiatric specialist, a surgical specialist, and an eye, ear, nose, and throat specialist. Its purpose was to check the medical categories of personnel being repatriated on medical grounds. The individuals were interviewed and a brief medical history was prepared on each case. After May 1944 the medical establishment of the station consisted of the S.M.O., one other medical officer, and other rank personnel.

The principal scene of R.C.A.F. hospital activity in the United Kingdom during the Second World War was at East Grinstead, Sussex, some 20 miles south of London. From 1944 the force operated a wing of the Queen Victoria Hospital there. Canadians were associated with this hospital at a much earlier date. In 1939 the E.M.S. had selected this hospital as a suitable one to which to attach one of the centres to deal with plastic surgery, burns, and jaw injuries. There were other British centres for cases of this sort, but this was the principal one. During the early years of the war burned and disfigured Canadian air force personnel were treated in one or other of these and in Canadian army hospitals. As the number of R.C.A.F. personnel engaged in training and flying in the United Kingdom grew, the number of casualties

admitted to these centres increased to such an extent that it was felt in their best interests to attempt to centralize their treatment. This attitude was strengthened by the fact that Canadians, on the whole, preferred to be among fellow Canadians, and treated by a Canadian medical staff. This was particularly true and of special importance in the case of patients such as those for whom long periods of hospitalization and repeated operations were necessary.

East Grinstead was chosen as the site of a Canadian centre for this type of casualty and late in 1941 the principal medical officer of the R.C.A.F. overseas was attached there. He proceeded to his new duties in January 1942, and in March directions were issued by the Ministry of Health to all Emergency Medical Service hospitals and installations that all R.C.A.F. personnel requiring plastic or maxillo-facial treatment were to be transferred to East Grinstead as soon as possible. Similar instructions were sent in October by the D.G.M.S., R.A.F., to all R.A.F. hospitals and units.

Shortly after the arrival of the Canadian medical officer at East Grinstead, a request was made to the Ministry of Health for the attachment of additional R.C.A.F. personnel: an anaesthetist, two nursing sisters, and two orderlies. It was hoped in this manner to have ultimately a well trained unit which could continue and complete such plastic surgery as might be required on R.C.A.F. personnel in Canada after repatriation. The Ministry of Health agreed to this plan, and a signal was sent immediately by the principal medical officer to Air Force Headquarters in Ottawa stating that it was considered that a maxillo-facial unit should be trained in Great Britain to carry out plastic surgery and requesting that the necessary personnel be posted for attachment to East Grinstead. This was agreed to, and in June 1942 an anaesthetist and two nursing sisters arrived. In July the first all-Canadian operation in the hospital took place. A further nursing sister was added to the establishment in October, and in the spring of 1943 two nursing orderlies, who were to be trained in the special technique of saline baths and care of burns, arrived. The total number of Canadian personnel at the hospital was thus seven.

During 1942, 38 new R.C.A.F. cases and 16 readmissions were admitted to the R.C.A.F. section; this represented a rise in the total number of air force cases and it was known that the number which would have been admitted had accommodation been available was much greater. Although the Canadian section was treating more and more members of the R.C.A.F., it was, in fact, handling an ever diminishing proportion of the total number of R.C.A.F. personnel suitable for admission to its care. Provision for extra beds was impossible at East Grinstead because of the already crowded conditions prevailing there. The building of a Canadian wing appeared essential.

Accordingly, the Canadian government was requested to provide the funds to build a wing at the hospital to accommodate Canadian personnel.

After some delay, the government agreed in June 1943 to provide the sum of \$80,000 for this purpose. The assistance of the Royal Canadian Engineers was enlisted for construction, and the work was begun in September. Due to difficulties in procuring building materials, the wing was not completed until the summer of 1944. It provided accommodation for 50 patients, and was equipped with modern facilities including two saline baths for the treatment of burns. The wing was originally equipped by the Canadian government, but maintenance was the responsibility of the Queen Victoria Hospital.

A detachment to operate the wing was formed with effect from 1 July 1944. It functioned under the control of the D.M.S., R.C.A.F. Overseas, and personnel were considered to be on strength at R.C.A.F. Overseas Headquarters. On medical matters the officer commanding the detachment and his associates were to work in conjunction with the senior medical officer of the hospital. Just prior to the move to the newly completed wing, a new establishment was authorized increasing the number of personnel from seven to 51. There were 18 officers: the commanding officer and senior surgeon, an assistant surgeon, an anaesthetist, one other medical officer, a matron, 12 nursing sisters, and one women's division messing officer. In addition, there were 33 other ranks, of whom 15 were women's division personnel, serving as medical clerks, wardmasters, hospital chefs, hospital and laboratory assistants, and general duty personnel. In May 1945 an administrative officer was added to the establishment; one had been carried as supernumerary since the new wing had been opened.

The first patients were transferred to the new unit in July 1944, and in September the D.M.S. overseas sent a circular letter to all air force units advising them that all cases involving burns, facial injuries, mandibular, maxillary and nasal fractures, as well as all other cases requiring plastic surgery, were to be referred to the new wing as soon as their general condition permitted. Assurance was given that the office of the D.M.S. would cooperate in evacuating aircrew by air from their unit to Gatwick, the airfield nearest to East Grinstead.

Since the Canadian medical services had adopted a policy of forming joint services treatment centres in Canada to make the fullest use of available skilled medical personnel from all the services it was decided that the same policy should obtain overseas. Thus, the wing at East Grinstead in conjunction with the army neurological and plastic surgery hospital at Basingstoke* was to be considered a special treatment centre for plastic surgery. Personnel from all three services might be admitted to either centre, and the medical staff for both might be supplied by all services with East Grinstead staffed essentially by R.C.A.F. personnel and Basingstoke by R.C.A.M.C.

* Established in 1940. See p. 102.

personnel. In practice the two units remained distinctly separate, and there were very few occasions on which a member of one service was admitted to the centre of another service.

The work at East Grinstead ran the gamut of the field of plastic surgery. In addition to the surgical work, the staff gave considerable thought and effort to the psychological aspect of the treatment of severely burned and deformed personnel. The patient's mental attitude was closely watched. To combat the lowering of morale, to which so many of these patients were prone, the staff discussed a patient's case with him in order that he might adopt a more objective attitude towards his disability, and directed attention to making the patient's physical and social environment as agreeable as possible. The latter point was thought especially important. A cheerful outlook was regarded of paramount importance in leading the patient to a realization that he need not become a recluse, and in giving him the courage to meet the general public once again. Efforts were made to reduce military discipline to a minimum and to provide the comforts of home. In this respect the auxiliary services played an important part. Facilities of the main hospital, such as those for physiotherapy and occupational therapy, were available for R.C.A.F. personnel, as were also a number of British convalescent centres. So successful was the work of the staff from both a surgical and psychological point of view that approximately 80 per cent of the aircrew patients recovered sufficiently to return to flying duties.

It was stipulated that the policy for repatriation of plastic surgery patients would be the same as that for other cases of illness or injury, that is, they were to be returned to Canada unless they would be fit for full duties within three months. But after it was pointed out that most individuals with marked disfigurement would prefer to have their plastic operations completed in the United Kingdom, and that there were certain cases which would seriously suffer from lack of adequate treatment during the time involved in repatriation procedures, it was agreed in June 1944 that the disposal of such cases be left to the discretion of the D.M.S. overseas.

The R.C.A.F. wing operated until August 1945, and in the following month, in accordance with the intention at the time of building, it was handed over to the authorities of the Queen Victoria Hospital as a memorial to both staff and patients.

R.C.A.F. Medical Board, London

The creation of an R.C.A.F. medical board overseas had been recommended by the first principal medical officer in London as early as February 1940. No action was taken at that time, but the desirability for reasons of morale and administration of having R.C.A.F. personnel boarded by R.C.A.F. medical officers came to be more widely recognized: this was in accordance with the policy of having Canadians treated by Canadians

whenever possible. Especially was this the case when it became apparent that R.A.F. medical standards and attitudes were found to differ in many respects from those of the Royal Canadian Air Force. For a long time it was not feasible to form a board due to the wide dispersal of Canadian personnel throughout the United Kingdom. With the formation of the Repatriation Depot at Warrington in the fall of 1942, this difficulty was partly overcome, and a medical board was instituted at the depot. This board carried out R.C.A.F. medical repatriation policy as best it could. Patients whom station medical officers considered medically unfit for service in the United Kingdom were posted to Warrington and the board made the final decision on repatriation. It was not well located for its purpose, and accommodation for patients and for the board itself was inadequate. In the winter of 1943 it became apparent that less than half the medical boards on R.C.A.F. personnel were being done at Warrington.

In November 1943 a memorandum was submitted to the D.M.S. recommending the establishment of a medical board in London. The memorandum stressed the desirability that final recommendations regarding categorization and disposal of R.C.A.F. personnel should rest with the R.C.A.F. medical authorities since they would be in a better position to know the facilities in Canada for the treatment of certain types of cases and would, therefore, be able to exercise better judgement when the question of repatriation on medical grounds arose. In view of the fact that the board at Warrington would never be able to conduct medical boards on more than a limited number of personnel because of its disadvantageous location and inadequate accommodation, it was urged that London should be the site of the Canadian board. An additional reason for choosing London was that the board could work in close co-operation with R.C.A.F. headquarters and would therefore be familiar with policy regarding repatriation, suitable postings for limited categories, and other subjects. Both D.M.S. (Air) and D.G.M.S., R.A.F., agreed to its formation. D.M.S. (Air) thought that in addition to performing the routine board work, the specialists could keep abreast of developments in their fields and acquaint the medical authorities in Canada with them. He also felt that they could keep in touch with the larger R.A.F. and R.C.A.M.C. hospitals where R.C.A.F. personnel were hospitalized.

Approval was secured from A.F.H.Q. in Canada and the board opened on 1 May 1944. It was located in Hans Mansions, where adequate accommodation for all purposes was provided, and functioned there until after the end of the war in Europe.

There were originally eight officers on the staff of the board. In addition to the president, there was an internist, a surgical specialist, an ophthalmologist, an otorhinolaryngologist, a psychiatrist, and two general duties medical officers. In October 1944, because of the greatly increased volume of ophthalmological work, another specialist in this field and an ophthalmic assistant were sent from Canada. An additional internist and a neuropsychiatrist

chiatrist joined the staff in February 1945, giving it a total of 12 officers. There were also 11 other rank personnel: the greater number of these were medical clerks, but there was also a laboratory assistant, an x-ray technician, and, for a time, a technical assistant. The number of medical clerks was increased in August 1944 due to a greatly increased amount of clerical work.

The board itself actually consisted only of the president and the two general duties medical officers; the specialists acted as advisers to the board in their own fields. The latter gave an opinion when an individual, after having undergone a complete physical examination from one of the general duties medical officers, was referred to them. When adequate information for diagnosis and recommendation of disposal was available as a result of various examinations, the case was then interviewed by the president who made the final decision as to disposal. If further investigation or treatment were necessary the patients were referred to one of the Canadian general hospitals near London.*

All R.C.A.F. personnel formerly boarded either at the Repatriation Depot or by one of the various R.A.F. medical boards were now directed to London. In the 13-month period from its inception until the end of May 1945 the board handled 6312 cases. The board functioned primarily as the instrument of R.C.A.F. repatriation policy, and approximately one third of the cases it dealt with were medical repatriates. A variety of other cases were handled. Any case which the senior medical officer of a station, or of a Canadian army hospital in which an airman was a patient, considered should be boarded, was sent to it, as were all evaders, (that is, those who evaded capture) certain liberated prisoners of war whom the medical officers at the reception centre at Bournemouth thought should be seen by the board, exchanged prisoners of war, transfers from the R.A.F. to the R.C.A.F., a small number of discharges in the United Kingdom, and consultations, the latter usually from the London area. Up until 31 May 1945, more than 500 evaders and prisoners of war appeared before the board. About 600 men seeking transfer from the R.A.F. to the R.C.A.F. were boarded prior to the same date. Consultations numbered approximately 550 between 1 May 1944 and 31 May 1945.

Close liaison was maintained with R.A.F. consultants and specialists, and members of the board frequently attended meetings of R.A.F. medical committees. Certain R.A.F. medical facilities were made available to the R.C.A.F. and were often used.

The creation of an all-Canadian board proved to be more than justified. The handling of Canadians by Canadian medical officers was appreciated by all concerned, and it was generally recognized that the new arrangement allowed for greater personal care of individuals than had been the case when they came before R.A.F. boards. The board was able to explain to

* See Appendix "E", *Static Medical Installations in the United Kingdom*, 15 May 1944, and map *The United Kingdom, 1939-1946*, after p. 112.

individuals their illnesses as well as the treatment they were to receive; this was a considerable help to Canadians who are accustomed to this sort of medical care.

The hope that the specialists could keep their colleagues in Canada informed on recent developments and problems abroad in their fields was not fulfilled to any appreciable extent. This was due primarily to the fact that there was usually only one specialist in each field, and his first duty was to attend to board work. The exception to this was in ophthalmology, on which subject valuable information was sent to Canada from time to time.

Some of the specialists thought that more opportunity might have been given to them to visit units in order to familiarize themselves with station life. This was felt to be particularly important for psychiatrists since they had to be familiar with the stresses to which aircrew and groundcrew were exposed. By means of visits, the psychiatrist could help both the station medical officers and executive authorities to recognize psychiatric cases at an early stage.

It was in the field of psychiatry that the board did some of its most valuable work. The most important problem faced by the psychiatrists on the board was presented by aircrew who might later be classed as L.M.F. (Lack of Moral Fibre) cases. In these cases the psychiatrist was required to make a recommendation as to the medical category which the man should have in view of his mental health. In addition, he was to give his opinion on whether the nervous symptoms shown were due to inability to stand up to the strain of flying duties, and on whether the man had done his best to carry on, due consideration being given to the degree of his predisposition to develop nervous symptoms.

The board provided a different method of approach to these cases from that used by the R.A.F., and in fact the fundamental differences between R.C.A.F. and R.A.F. psychiatrists on the method of handling them was one of the reasons why the board was formed. Canadians occasionally held a different opinion on a man's ability to fly in certain circumstances and they felt that the R.A.F. sometimes penalized men for refusing to fly when they were unable to do so. The Canadians generally took a more lenient view, and more readily recognized that there was a breaking point for most men either because of fatigue, stress, or psychological illness, and that a man who refused to fly was not necessarily doing so through wilful neglect or irresponsibility. Their opinion was that men who broke down in this way were usually unfit for flying duty, either temporarily or permanently, from a medical point of view and that they were therefore more properly cases of flying stress than L.M.F. It was an important point because those classed as L.M.F. were stripped of their flying badges and reduced to the ranks.*

* FEASBY, W.R., *Official History of Canadian Medical Services 1939-1945*, Vol. II, pp.98-9.

Medical Arrangements in Other Theatres

Although the principal scenes of R.C.A.F. activity overseas were the United Kingdom and North-West Europe, there was some participation by the force in other war theatres. One squadron, No. 417, with its medical officer was sent to Egypt in the spring of 1942. It subsequently served in the Western Desert, Tunisia, Sicily, and Italy. Here again, as in the United Kingdom, the Canadian medical officer was responsible to the principal officer of the R.A.F. formation to which his squadron was attached. Evacuation of Canadian air force casualties in Italy was to the Canadian general hospitals functioning in this theatre.* Three squadrons, Nos. 420, 424, and 425, with Canadian medical personnel operated in the Kairouan area of Tunisia for four months in 1943. Minor sick were treated on the stations and seriously ill or injured casualties were evacuated to a British hospital in the vicinity.

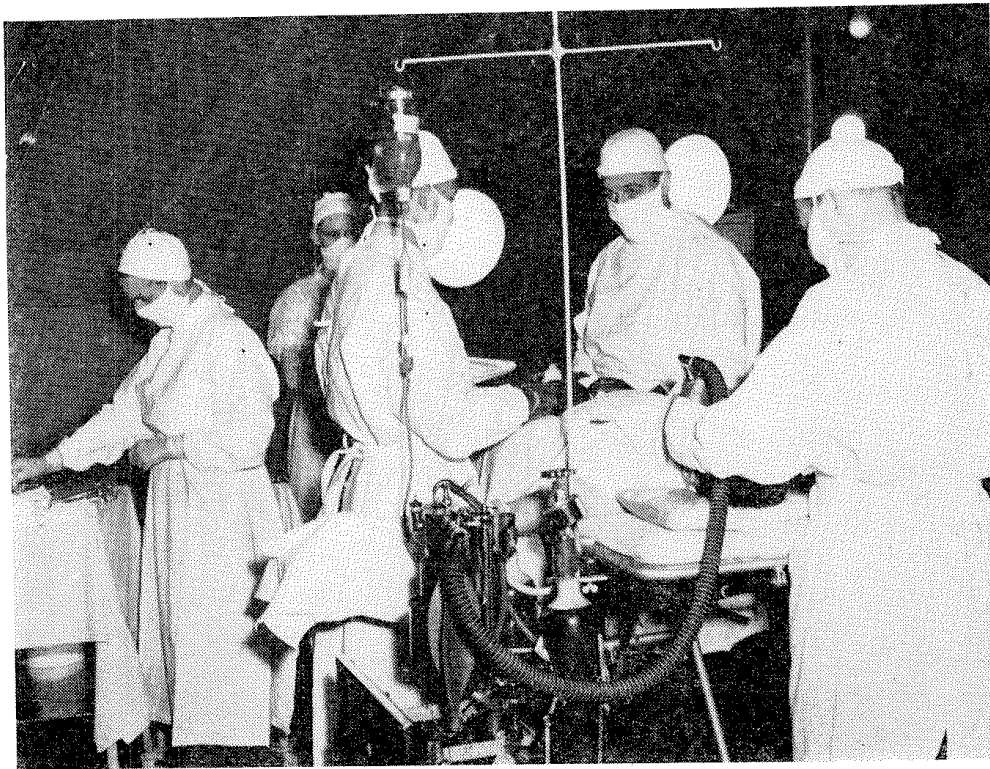
While many Canadians served in R.A.F. squadrons operating in Asia, there were only three purely Canadian squadrons in service there. One of these, No. 413, served in Ceylon from April 1942. The other two squadrons, Nos. 435 and 436, formed in India in October 1944 and took part in the campaign in Burma. In addition to the medical officers of these squadrons, the R.C.A.F. provided medical liaison officers in Cairo and Delhi. The latter were responsible for expediting the medical care of Canadians and providing adequate documentation for the Canadian authorities.

No. 52 (R.C.A.F.) Mobile Field Hospital

The R.C.A.F. formed approximately 50 per cent of one of the two groups in the 2nd Tactical Air Force (2nd T.A.F.) which acted in close support of the armies in the invasion of North-West Europe and in subsequent operations in that theatre. Squadron medical officers were, of course, attached to the Canadian units; they were responsible to the principal medical officer of 2nd T.A.F.

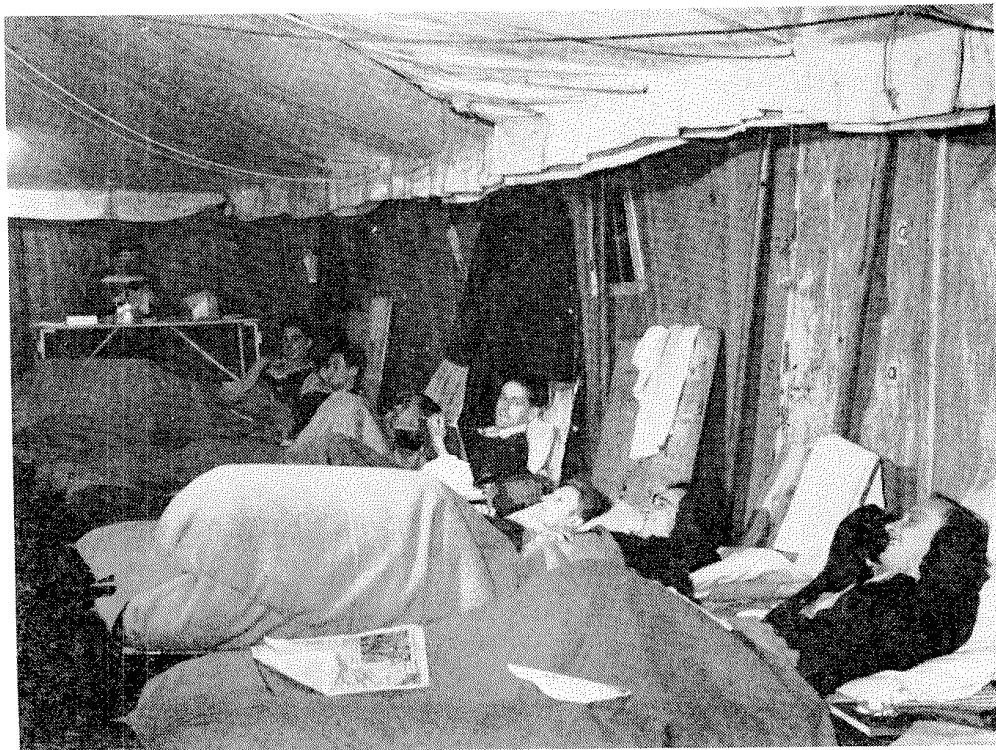
The principal R.C.A.F. medical contribution to 2nd T.A.F. was No. 52 Mobile Field Hospital. Like R.A.F. M.F.Hs. it was a self-contained, mobile unit, equipped with sufficient trucks, trailers, and tenders to carry all equipment and staff and sufficient ambulances to move patients. It could be set up entirely under canvas, but whenever possible suitable buildings were taken over. The staff consisted of seven officers, of whom four were medical officers, two were nursing sisters, and one was an administrative officer, and approximately 70 other ranks, of whom about 30 were medical personnel. Tentage was provided for a bed accommodation of 100, but more could be obtained from the nearest air stores park if, as sometimes happened when the hospital acted as a holding unit for casualties awaiting evacuation by air, it

* There were five Canadian general hospitals, Nos. 1, 3, 5, 14, and 15, in Italy during the greater part of the Italian campaign.



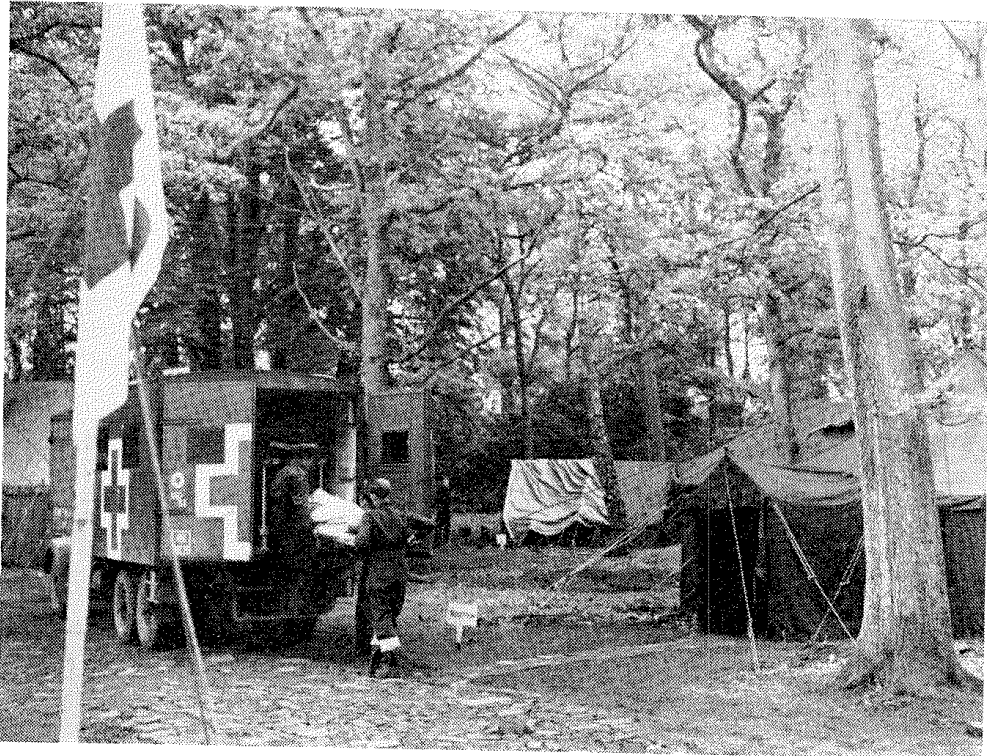
IN THE OPERATING THEATRE

Surgery is performed at No. 52 Mobile Field Hospital, England, 29 May 1944.

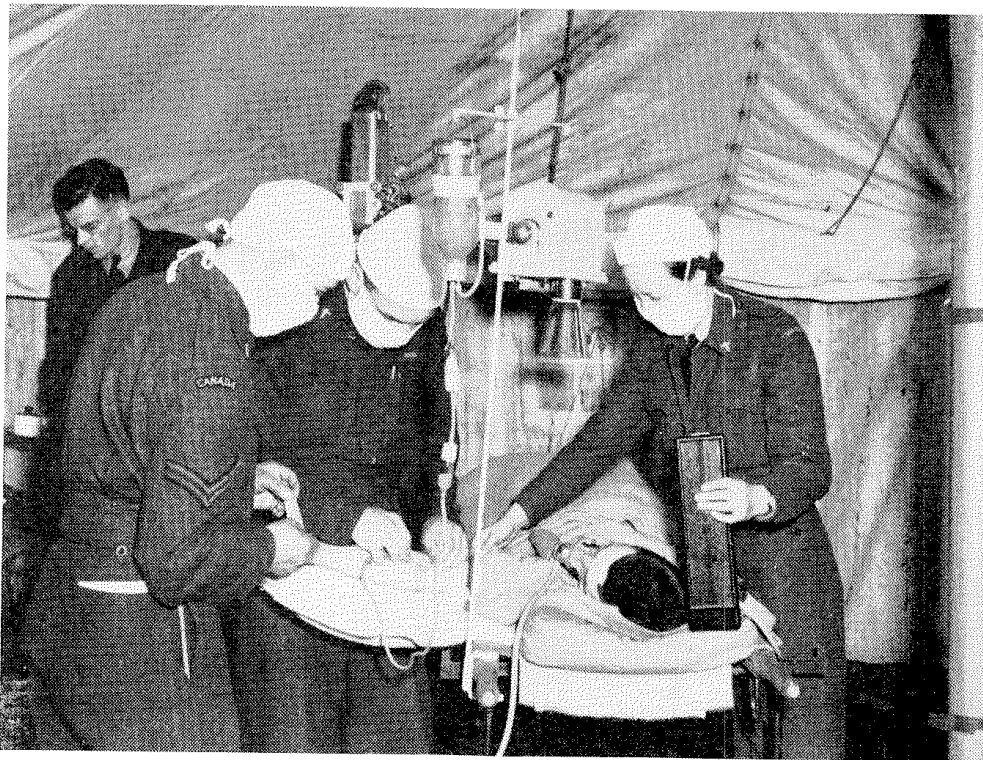


A WARD OF NO. 52 MOBILE FIELD HOSPITAL ENGLAND, MAY 1944

All field hospital equipment was required to be light in weight because of the need for mobility. Patients are shown here on lightweight beds which stood just off the ground; regulation hospital beds were carried only for the seriously wounded. The tent was heated by paraffin stoves.



A PATIENT ARRIVES AT NO. 52 MOBILE FIELD HOSPITAL
A patient is carried from an ambulance to the reception tent where the nature of his injuries will be investigated, England, 29 May 1944.



RESUSCITATION AT NO. 52 MOBILE FIELD HOSPITAL
Oxygen is administered to a patient while a medical officer inserts a tube carrying blood plasma into his vein, England, 29 May 1944. Note the canvas walls, ceiling and floor.

proved necessary to expand the bed capacity to 150 or 200. Normally not more than 40 to 50 casualties were accepted. A portable x-ray machine and equipment necessary for emergency surgery were provided.

The function of mobile field hospitals was to receive sick and wounded, army as well as air force, from collecting zones and retain them until they were fit either to return to duty or to be evacuated to base hospitals. Cases were generally not retained for prolonged treatment. These units were principally concerned to ensure that casualties received adequate early treatment, and they formed the first air force link in the chain of evacuation. They also provided specialist attention for aircrew when the need arose. They were usually located near an airfield where aircraft would be available for evacuation, but were to be as readily accessible as possible to all units they were to serve.

The formation of No 52 M.F.H. was authorized by the Air Ministry on 16 August 1943, and it formed in the following weeks in No. 83 Group at the R.A.F. station at Detling, Kent. It was one of the two mobile field hospitals of this group.

Throughout the fall, winter, and spring months unit personnel underwent intensive training in southern England. Exercises were held in the collection and treatment of patients and training was given on chemical warfare, first aid in the field, and venereal disease prophylaxis. The unit underwent field practices which were designed primarily to test its mobility, to see how rapidly setting up camp and repacking to move again could be accomplished. In March 1944 an advanced surgical team was organized as one echelon of the unit. It consisted of a surgeon, an anaesthetist, and nine other ranks from the main body of the unit, and was completely self-sufficient, mobile, and capable of doing any emergency surgery. The functional capacity of the main body was not impaired by the separation of the team.

The unit moved to the Continent almost immediately after the initial allied landing there, the advanced surgical team landing on the beachhead at Bernieres-sur-Mer* on 8 June. It was sited near Creully, and immediately began to treat a number of army and air force casualties. Eleven days later it was joined by the main body of the hospital, and the first camp site was then pitched near Reviere. During the days that ensued the unit was only moderately busy; casualties were mostly from the R.C.A.F. although some army personnel were admitted. On several occasions the surgical staff operated throughout heavy German air raids. At this time the M.F.H. held patients for a week; this was later extended to two weeks and finally to three.

* This and other places mentioned in the text in relation to No. 52 (R.C.A.F.)M.F.H. may be located by reference to the following maps: *Eastern Flank of the Normandy Bridgehead, June-July 1944*, after p. 235; *The Pursuit and the Channel Ports, August-September 1944*, after p. 255; *Battle of the Rhineland February-March 1945*, after p. 280; *The Final Phase, March-May 1945*, after p. 303; *North-West Europe, 1939-1945*, front end-paper.

Late in June the hospital moved to a field at Vaucelles, about two miles from Bayeux, where it remained for a busy three weeks. An intensive welfare programme was inaugurated here for both patients and staff. There was a programme of occupational therapy, a library was begun, clubs were organized, and games encouraged. Training in occupational therapy was given by a welfare officer to nursing sisters and hospital assistants who in turn undertook to instruct the patients.

Towards the end of July the unit moved to Banville, where it remained until 7 August when it moved to a site near Tilly-sur-Seulles. The unit had fewer admissions in August than in July due generally to a change in siting and to the opening of M.F.Hs. of No. 84 Group and of a number of army general hospitals in locations closer than it was to some of No. 83 Group units.

Following closely the breakthrough from Lower Normandy, the unit moved, on 1 September, to Val David, about 20 miles south-east of Elbeuf. Two further moves were made in rapid succession during the first two weeks of September when the hospital followed in the wake of No. 83 Group which, in support of the British Second Army, moved rapidly across northern France and into Belgium: on 3 September it moved to Grand Villiers, near Amiens, and on the 8th to Steerebeek, about eight miles east of Brussels, where it became operational on the 10th. Here it remained until the second week of October when it moved to Eindhoven, Holland, where it remained until the end of March 1945. At Eindhoven the unit went into winter quarters; a hospital building was taken over and shared with a British mobile field hospital. It was a modern building with accommodation for 320, and had been used for the previous 18 months as a German naval hospital. Each mobile field hospital had its own reception wards, operating theatres, and administrative offices. They therefore functioned separately medically and administratively, but they shared some facilities.

A new series of moves began on 1 April when the hospital moved to Goch, Germany. A further move was effected on the 15th of the month, this time up to and across the Rhine to Achmer in the Osnabrck area. On the 17th the unit moved to Wunstorf, about 15 miles west of Hanover, and by the 28th of the month it was at Luneberg, some 70 miles east of Bremen, where most of it was located in buildings. The end of the war a few days later found the hospital at this site, and a surgical team from it about 60 miles north in a German hospital at Neumunster caring for a Canadian pilot who had crash-landed some two weeks previously and who was dangerously ill. Shortly after VE Day a surgical team from the hospital flew to Copenhagen, Denmark, with an R.A.F. wing. This team was subsequently converted to a detachment to provide medical facilities for the wing. The hospital itself remained at Luneberg until it became non-operational on 8 August. It then moved to Dunsfold, England, where it was disbanded.

Complete figures on the number and type of cases are not available, but the medical ward alone had a turnover of 550 cases in the six-month

period ending 31 July 1945. In April 1945, the last complete month before the termination of hostilities, there were 111 admissions of all sorts. Operations performed during the same month numbered 24 and laboratory examinations 339.

The equipped bed state of the unit varied greatly not only from site to site, but at different times at the same site, and the amount of tentage it was necessary to set up and equip depended on the actual or anticipated need. In April 1945, for example, there were 71 beds equipped; in the following month the figure rose to 200 due largely to an influx of casualties awaiting air evacuation.

In common with R.A.F. mobile field hospitals, No. 52 M.F.H. had attached to it a casualty air evacuation section. Casualties requiring lengthier treatment than that given at the M.F.H. were generally evacuated through the section to the nearest available airstrip. During the first weeks on the Continent the M.F.H. worked with British air evacuation units, but after 20 August 1944 an R.C.A.F. unit (No. 6 Casualty Air Evacuation Unit) was attached. Three days later this unit was disbanded, and, with effect from 24 August, its personnel were posted to the mobile field hospital to form the casualty air evacuation section of the hospital. Except for a brief period after this date and for the final period in Germany after VE Day, the section and its parent unit were separated by a variable number of miles. Occasionally, when aircraft failed to arrive or air evacuation was held up for some reason, the hospital functioned as a holding unit for the section. In May 1945 it accommodated 752 casualties awaiting evacuation by air; the number dropped sharply following the cessation of the war in Europe and in June 99 were held by the unit.

Air Evacuation Programme

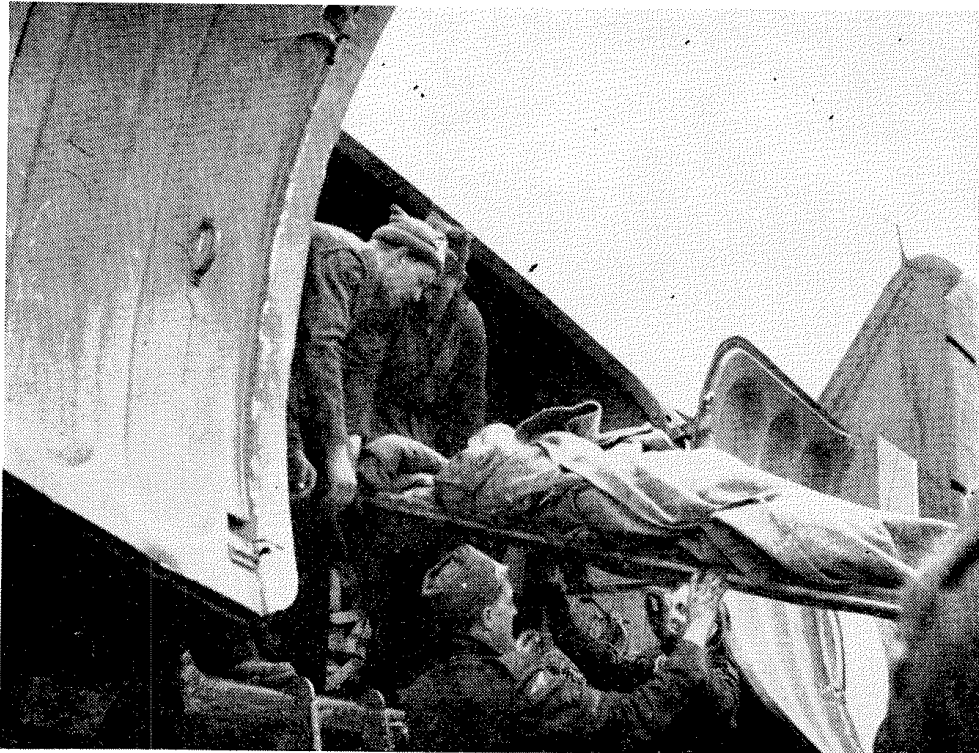
Participation by the R.C.A.F. in casualty evacuation by air began with the formation of No. 6 Casualty Air Evacuation Unit in May 1944 for operation in North-West Europe. The transportation of casualties by air in the Second World War had already been widely practised; the Germans had employed it as early as the Polish campaign and the British had actively adopted it in North Africa, Sicily, and Italy. Assuming air supremacy, it was the system preferred for all evacuation over 100 miles, especially where a sea crossing was involved. The principal advantages of this method of evacuation were the saving of time in getting casualties to base hospitals, the absence of repeated handling of patients, the relative smoothness of air travel, the saving of manpower, and the saving of shipping and transport required to carry stores and medical equipment forward especially when the lines of communication were long. Some of its limitations were those imposed by the vagaries of the weather, partially overcome before the end of

the war, and the fact that certain types of casualties could not be carried by air if the aircraft had to fly at altitudes of over 10,000 feet or in very rough weather.

In preparation for the invasion of North-West Europe, the R.A.F. had set up, under Transport Command, a casualty air evacuation plan, the essential feature of which was that transport aircraft carrying troops and supplies to advance bases would be used to carry casualties on the return journey. This plan actually began to function as early as 13 June, only one week after D Day. The aircraft used were generally Dakotas, which were capable of carrying a maximum of 24 casualties. Initially, casualties were evacuated from airstrips close to the Normandy beachhead to a reception centre in England. Later, when the fighting moved eastwards and the lines of evacuation were lengthened, a "forward shuttle" came into operation; by this method casualties were transported from advanced to continental base airfields from where they were flown back across the channel. Direct air evacuation to the United Kingdom continued to be carried out as well. For the shuttle service small Harrow aircraft were used. These needed only a short runway for take-off, compared favourably in speed and endurance with the Dakotas, and, like the latter, accommodated a maximum of 24 casualties. They were known as "Sparrows" after their conversion to air evacuation use.

Casualties to be evacuated by air had always to be waiting for the aircraft, since grounded aircraft were easy targets for the enemy and were not to remain at advanced airfields longer than absolutely necessary. Their care at the airfields was provided by casualty air evacuation units. The latter were primarily holding units; they kept cases, usually for a matter of hours only, pending the arrival of aircraft, and had limited facilities for resuscitation and urgent treatment. If expected aircraft did not arrive, patients were returned to their former medical units where better facilities were provided. Personnel of the unit were trained to load and unload casualties from aircraft in the shortest possible time. When necessary the units supplied air ambulance orderlies to accompany aircraft; the orderlies were sent back by any available transport, usually air. The medical officer of the unit was the deciding authority on priorities and also whether or not casualties were fit to be carried by air. It was his responsibility to inform the mobile field hospital, to which the unit was attached, and nearby army medical units when casualties could be evacuated and the number that could be taken. Close liaison existed between this officer and Transport Command so that casualties were sent to the airfield where aircraft were available.

No. 6 C.A.E.U. formed part of this scheme. This unit could accommodate a maximum of 50 casualties, and had sufficient transport and equipment to make it completely mobile and self-sufficient. Its medical staff consisted of two officers and 12 other ranks (hospital assistants); the latter had taken a special two-week course in air evacuation at Rockcliffe, Ontario, in January 1944. Training continued after formation of the unit in England and all per-



AIR EVACUATION

Evacuation by air of Canadian casualties in North-West Europe began a week after D Day. These photographs show scenes of some of the first evacuations from airfields in Normandy. Here a Canadian casualty is placed in an aircraft, 16 June 1944. In the photograph below a wounded soldier is shown being made comfortable by a medical orderly before the twin-engined Dakota takes off for England, 17 June 1944.



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sonnel were acquainted with the method of handling patients and loading and unloading them from aircraft. Practice in pitching and striking camp was also given as accommodation for both staff and casualties was tented. On 18 August 1944 the unit went to the Continent where, as noted above, it shortly became the casualty air evacuation section of No. 52 M.F.H. It worked closely with this unit throughout the campaign in North-West Europe. As airfields were captured or constructed behind the advancing troops, the section would establish itself on these and prepare to evacuate casualties either to airfields in the rear or in the United Kingdom.

Canadian aircraft also participated in the air evacuation scheme but their number was necessarily limited in view of the fact that there were only two R.C.A.F. transport squadrons overseas.

Upon arrival at the reception centre in the Swindon area in England, the medical focal point of all returning casualty evacuation aircraft, all Canadian casualties, with the exception of a few cases requiring urgent treatment, were dispatched by motor ambulance convoy to Taplow, some 50 miles eastward, where the nearest Canadian general hospital (No. 11) was located. This procedure, besides often entailing severe discomfort to many ill and tired patients, had the effect of converting a static 600-bed general hospital virtually into a casualty clearing station because of the rapid turn-over of patients. Representation was made to the Air Ministry for the institution of an internal air lift whereby Canadian personnel would be reflowed from the reception area to two of the many airfields available in the vicinity of several Canadian hospitals. As a result the necessary aircraft were provided and two casualty air evacuation detachments were formed in September 1944 for the reception of returning casualties. Each of the detachments was composed of one medical officer and ten other ranks. With the exception of the medical officers, almost all the personnel had taken special training in air evacuation in Canada. The detachments were located at R.A.F. stations at Dunsfold and Farnborough,* and the scheme was in full operation from September onwards.

By this means, access was had by relatively short ambulance trips to Canadian general hospitals at Horsham, Cuckfield, and Horley from Dunsfold and to those at Taplow, Pinewood, and Bramshott, as well as to Basingstoke Neurological and Plastic Surgery Hospital, from Farnborough.* Ambulances and stretcher-bearers were generally provided by the R.C.A.M.C. Facilities for immediate hospitalization were available within five minutes of the landing field at the general hospital at Farnborough. As no such facilities existed at Dunsfold, the detachment there was moved shortly to the R.A.F. station at Gatwick which was immediately adjacent to No. 9 Canadian General Hospital at Horsham. Two further moves were made at later dates to conform to changed conditions: from Gatwick to Redhill, Surrey, in

* See map *The United Kingdom, 1939-1946*, after p. 112.

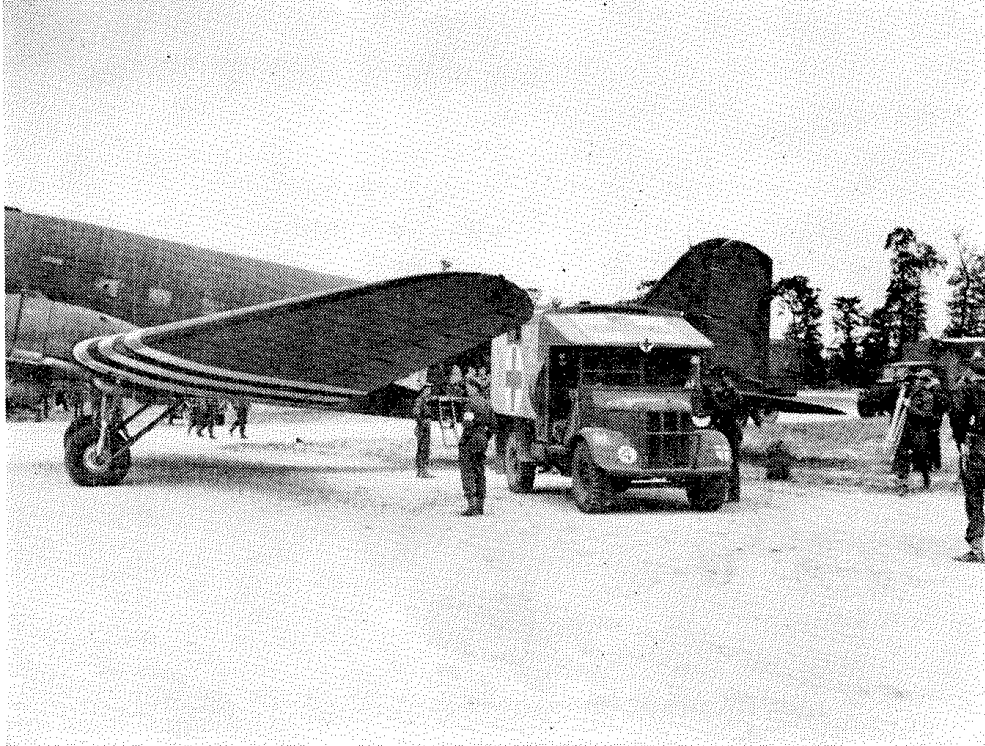
February 1945 and from Farnborough to nearby Blackbushe the following month. These detachments remained fully operative until the end of June 1945.

Once this scheme was operating smoothly an effort was made to have Canadian casualties flown directly to the two R.C.A.F. units, thus obviating the change of planes at Swindon and the further air journey, an arrangement entailing the sorting of Canadian casualties on the Continent. After discussions with the Army and with the principal medical officer, 2nd T.A.F., it was agreed that this procedure would be followed whenever sufficient Canadian casualties were available and sorting on the Continent feasible. This began in October 1944, but it was only from February 1945 that the proportion of casualties flown directly to Canadian units increased appreciably. The air evacuation programme rendered a valuable service to both the Canadian Army and the R.C.A.F. From D Day until the end of June 1945, 16,531 Canadian casualties were evacuated by the R.A.F. and R.C.A.F. to England, and in the course of this operation not a single aircraft accident or death occurred.

Note may be made here of the limited air evacuation carried out at home in Canada. There were no large numbers of casualties to deal with here and the problem of evacuating by air was not as acute as it was overseas. Nevertheless, the R.C.A.F. transported both service and civilian patients from remote coastal regions and sparsely settled areas in Canada, Newfoundland, and Labrador, where hospital facilities were either non-existent or inadequate, to points where they received the necessary medical treatment. This practice had become of such scope by 1943 that a number of measures were taken from then until the end of the war to systematize it.

As it was not proposed that special aircraft be supplied for air evacuation purposes, it was necessary to modify certain suitable aircraft in such a way that when they were not being used to transport patients their normal functions would be in no way impaired. Norseman and Dakota aircraft were found most suitable, and both could be fitted with web stretcher-bearing equipment which could be quickly and conveniently stowed when not in use. Aircraft were held at each command for the transport of cases from areas either inaccessible or difficult of access by road or rail to command hospitals where specialists in the various fields of medicine were available. In addition, aircraft were available for the transport of patients from Labrador and Newfoundland.

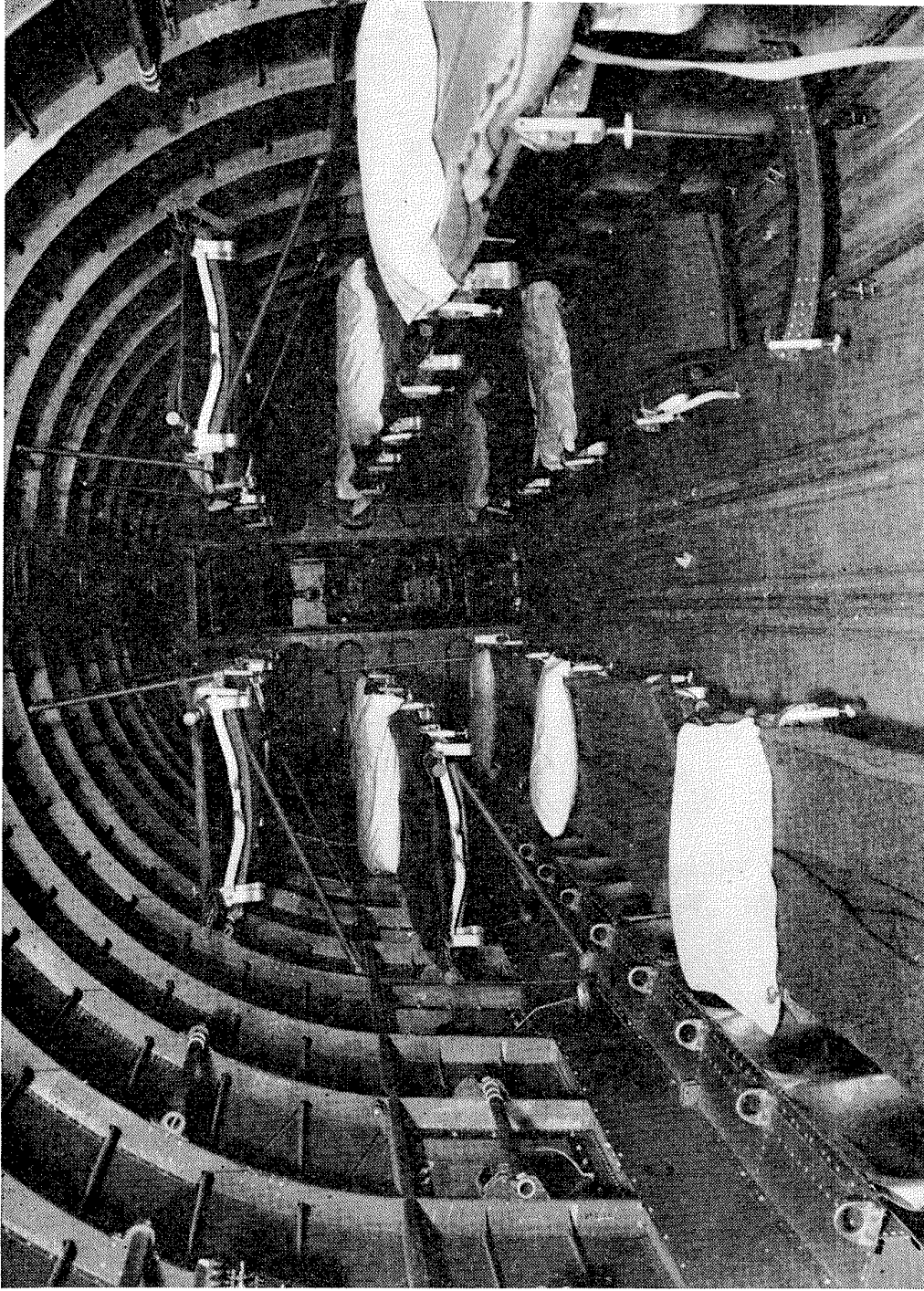
A small group of medical officers, nursing sisters, and hospital assistants were trained in the specific problems of air evacuation, chief among which were those concerning the selection of patients suitable for air evacuation and those dealing with specific therapy during flight. In addition, the R.C.A.F. developed equipment for use in air evacuation. This equipment included a new stretcher and a casualty bag. The stretcher was made of hollow plywood poles and light weight metal runners and spreaders. The weight of the



CASUALTIES BEING LOADED INTO DAKOTA AIRCRAFT

An ambulance backs up to the double doors of a Dakota to transfer wounded, Normandy, 16 June 1944. The photograph below shows a soldier, wounded in the fighting at the front, being transferred from an army ambulance to an aircraft at an airfield in Normandy, 17 June 1944. Once in England, Canadian casualties, except emergency cases, were immediately sent to one of the Canadian general hospitals there.





EVACUATION AIRCRAFT

An interior view of a Dakota aircraft as set up for the evacuation of patients, August 1943.

stretcher was less than half that of an ordinary general service stretcher, a great improvement in view of the importance of weight in flight. The casualty bag was essentially a sleeping bag with zipper openings to permit access to any part of the patient with ease and without fully exposing the patient's body. The bags were found of use in extreme cold, but in more temperate weather blankets provided a better means of controlling the temperature of the patient.

THE CLOSE OF THE WAR

An increasingly important concern during the last year of the struggle in Europe was with the plans for Canadian participation in the war against Japan. A Canadian medical officer participated in the plans for *Tiger Force*, as the Commonwealth air component for this campaign was to be known, in London. These plans were far advanced by the time the war ended in Europe. Among the decisions affecting the medical branch was that authorizing an R.C.A.F. general hospital at Okinawa. When the war ended in Europe, the Canadian contingent to *Tiger Force*, consisting of eight R.C.A.F. heavy bomber squadrons, flew home across the Atlantic to prepare for its new role.

While plans were being made overseas, extensive medical preparations were carried out at home in order that the R.C.A.F. would be provided with the best medical care possible. Provision was made for a section in the directorate in Ottawa to handle the medical aspects of the campaign. In June 1944 a memorandum was sent to D.M.S. (Air) emphasizing the importance of the control of tropical diseases, particularly malaria, in military campaigns in tropical or semi-tropical areas. Attention was drawn to the fact that the Americans had developed special units for this purpose. If the R.C.A.F. medical branch were to be responsible for malaria control for air force personnel operating in tropical theatres, some organization similar to that built up by the Americans would be needed and the work of organizing the necessary units would require from one to two years. A further memorandum outlined the more serious tropical diseases encountered by the Americans and Australians in their campaigns against the Japanese. Malaria and dysentery were the two major diseases in tropical areas, but there was also a threat from epidemic typhus, scrub typhus, dengue fever, and filariasis. The importance of controlling these to the success or failure of a campaign was illustrated by citing instances of the tide of battle in the Pacific having been turned through the institution of proper control measures.

The medical branch was alert to the danger and aware of the need to prepare for the entirely new conditions expected to be met in the Pacific theatre of operations. The programme of training medical officers in tropical medicine, which had been begun earlier in the year, was continued.* The

* See p. 430.

deputy director (administrative) visited Washington in October 1944 to discuss with appropriate officials their medical requirements in tropical theatres of war, and the possibility of training additional R.C.A.F. medical personnel for tropical service. The American organization for the combatting of insect-borne diseases was thoroughly investigated, including the organization and equipment of the medical units and the use of the new insecticide D.D.T., the widespread use of which, the Americans had found, "was rapidly improving the general picture of malaria control".* The continued use of the facilities of the school in Washington was offered for the training of R.C.A.F. officers in tropical medicine, for medical associates qualified in entomology, and for laboratory technicians.

By January 1945 authority had been received to form anti-malarial units on the American pattern. At that time it was estimated that the R.C.A.F. would require six malaria control units and two malaria survey units, but these figures were subsequently reduced to three and one respectively.

A further aspect of the medical planning for the Pacific campaign was contained in a memorandum drawn up by D.M.S. (Air) in April 1945. This dealt with measures for the prevention of malaria in the event of the R.C.A.F. operating in malarious areas. Publication of these measures was withheld pending a definite decision as to where the R.C.A.F. would serve and in what numbers and formations. At the same time the question of the availability and supply of anti-malarial drugs and equipment was thoroughly investigated.

Fortunately the Japanese war terminated earlier than had been expected, and consequently all these plans were discarded.

The last task remaining for the R.C.A.F. medical branch concerned the repatriation and discharge of the thousands of air force personnel serving throughout the world. Extensive preparations were made for their return to civil life. Release centres were established for this purpose at a number of points throughout Canada, and medical arrangements at these were on a scale commensurate with the magnitude of the task.†

In the early months of 1945 consideration was given to formulating a policy for the retirement of medical officers. With the expectation that the war in Europe was drawing to a close, the demands of civilian practice, post-graduate opportunities, the urge to resume a civilian career — all exerted their influence on the medical officers serving in Canada at tasks which in many instances did not make great demands on their professional skill. Sensing a restlessness among the officers of the branch and confronted with requests for retirements, D.M.S. (Air) advised all serving medical officers that plans for an orderly system of retirement were being developed. D.D.M.S. (A) amplified the information and outlined a method of scoring the following factors in respect of each officer: length of service, age, marital

* D.D.M.S. (A) to D.M.S. (Air), 17 October 1944. HQ 450-M61, Volume I.

† See p. 453.

status, dependents, former practice, post-graduate plans, teaching appointments held, and desire with regard to release date. A weighted numerical value was assigned to each factor and totals for each officer were arranged in descending order of magnitude. This provided a nominal roll which was used as a guide to the orderly release of medical officers when it became possible to reduce the number in the service. It was an elaboration of the "first in, first out" principle, taking into account many other considerations which are important to individuals and fair to the service.

By the time hostilities had ended the medical branch of the R.C.A.F. had been in existence for close to five years. From the time of its inception at the end of one year of war, it had developed rapidly and soon provided the medical organization necessary for a service the peak strength of which (reached in January 1944) was 208,719. Its efforts represented a vast expenditure of human effort, involving some 1300 doctors and nurses and approximately 78 technical and administrative officers, as well as a considerable body of other rank personnel. In addition to treating Canadians both at home and in R.C.A.F. and R.A.F. formations and units abroad, the branch had provided medical care for the thousands of personnel from the air forces of the United Kingdom, Australia, and New Zealand training in Canada under the B.C.A.T.P. and thereby made a valuable contribution to the combined war effort.

MEDICAL ARRANGEMENTS FOR THE BRITISH COMMONWEALTH AIR TRAINING PLAN

THE AIR TRAINING PLAN

The great need for aircrew to secure and maintain air superiority over the enemy became apparent at the outset of the war. It was this need which gave rise to the plan among four members of the Commonwealth for the training of pilots and other aircrew in Canada for service overseas. The initial agreement setting forth the terms of this arrangement — known as the British Commonwealth Air Training Plan (B.C.A.T.P.) — was signed in Ottawa on 17 December 1939 by the governments of the United Kingdom, Canada, Australia, and New Zealand. This agreement was to remain in force until 31 March 1943 unless extended or terminated earlier by agreement of all parties. The Canadian government was to organize and administer the plan; the organization and executive command of the training schools was entrusted to the R.C.A.F.

The initial plan called for the establishment of 58 flying schools in addition to the schools and ancillary units needed to train staffs and provide an adequate command, recruiting, and maintenance organization. This plan, when fully functioning, was to produce 520 pilots with elementary training, 544 pilots with service training, 340 observers, and 580 wireless operator-air gunners every four weeks. A tremendous task thus faced the R.C.A.F. which at the time the agreement was signed was a small force with a strength of approximately 8000.

To administer the B.C.A.T.P. the R.C.A.F. organized four training commands. Air Training Command, which had been set up in September 1938, was redesignated No. 1 Training Command in January 1940 and Nos. 2, 3, and 4 Training Commands were organized in March and April of the same year. At the same time as these were being set up, a vast building programme was undertaken across the country: stations, schools, and ancillary units to implement the plan were rapidly set up. The first school to open was No. 1 Initial Training School, Toronto, and the first intake of training plan pupils was received there on 29 April 1940.

The plan underwent a number of revisions during the course of the war as the international situation changed, and the number of schools and other units fluctuated as experience indicated the number necessary to maintain the required flow of aircrew. Late in 1940, when enemy air action was seriously interfering with training in the United Kingdom, it was agreed that a number of R.A.F. schools should be transferred to Canada. The first of these, No. 31 Service Flying Training School, opened at Kingston, Ontario, on 7 October

1940. By the end of April 1942, the deadlines set in the original agreement for the opening of schools, there were 11 more training schools than had been planned in 1939.

Despite this favourable progress, a review of the situation early in 1942 by the governments concerned led to the conclusion that the plan should not terminate at the date originally set, and that there should be no reduction in its scope. Accordingly, on 5 June 1942, a new agreement was signed which was to become operative on 1 July, the old one terminating on the same date, and to remain in force until 31 March 1945. This second agreement set the target for flying schools at 77. It also stipulated that the R.A.F. units in Canada, of which there were at this time 27, would be administered by the R.C.A.F. in the same manner as units constituted under the B.C.A.T.P.; they were, however, to preserve their R.A.F. identity and the United Kingdom Air Liaison Mission was to have a voice in certain personnel and administrative matters.

Construction of the additional schools was begun, and was continued until peak strength was reached in January 1944. At that time there were 97 flying schools (73 R.C.A.F. and 24 R.A.F.). These included initial training schools, elementary flying training schools, service flying training schools, air observer and air navigator schools, bombing and gunnery schools, wireless schools, operational training units, and a general reconnaissance school. In addition, 184 ancillary units and formations were in operation.

With a sufficient reserve of aircrew trained or being trained by February 1944, it was decided to reduce intakes of pupils thereby permitting the progressive closing of a number of units, beginning with the R.A.F. transferred schools. A gradual reduction in the number of schools was carried out in the following months. In October the closing of units was accelerated and by the end of the year the number of training plan schools was reduced to 50 and the R.A.F. schools to two. This process continued until 31 March 1945 when the plan terminated, and all schools and ancillary units operating after that date ceased to be part of the B.C.A.T.P.

The total intake of aircrew trainees was 157,614. This figure does not include more than 5000 R.A.F. and Fleet Air Arm personnel who graduated from R.A.F. transferred schools prior to the date on which the latter came under the plan, nor almost 2000 who commenced training too late to graduate before the plan terminated. Some 26,000 of this intake failed, and the final total of graduates was 131,553, of which 72,835, or 55.4 per cent, were Canadian. A wide variety of units, totalling approximately 360, were operation during the five and a quarter years of the plan.

MEDICAL RESPONSIBILITY IN THE B.C.A.T.P.

The foregoing indicates to some extent the great scope of the plan and the job that the R.C.A.F. accepted and successfully completed. In the fulfilment of this task the medical branch made a notable contribution. Canadian

responsibility for administration of the plan involved the acceptance of responsibility for medical care of the thousands of recruits who passed through the training schools. This care was administered primarily through the training commands and the units within them, i.e., the training schools and stations; a few B.C.A.T.P. units came under Eastern and Western Air Commands but the latter were not directly concerned with the plan and were operational in character.

The structure of the R.C.A.F. medical organization, including the arrangements at commands and on stations and the provision of hospital facilities, has been discussed in Chapter 21. Within that organization a vast amount of activity was carried on for there were a number of special medical features to the airmen's training courses and the medical branch bore a heavy responsibility throughout the entire length of these.

The medical officer's responsibility started at the beginning of an airman's career. At the recruiting centre he was required to subject the potential recruit to a detailed physical examination in order to determine if he were fit for service and, if so, for what sort of service he was best suited. Special knowledge was needed of the medical requirements in the selection of the various aircrew categories. The selection aspects of the examination were carried out better after April 1940 when medical officers received some instruction in them at the School of Aviation Medicine.* It was important that any defects likely to involve the man's discharge should be noted on his examination form. This was especially important for otherwise the individual concerned might easily contend that a disability which came to light subsequently, but which he might have had at the time of enlistment, arose during his service. The government would then be saddled with responsibility for his care and, possibly, with the payment of a substantial pension.

During the first period of an airman's service, the medical branch again played an important role. After January 1943 airmen were quarantined for ten days at manning depot. A problem had arisen as a result of a number of epidemics of infectious diseases, some of which had occurred in association with the movement of airmen. There were epidemics of streptococcal infection, scarlet fever, mumps, and upper respiratory infections, and their sequelae were sometimes serious. It was felt that if recruits were kept under observation for this period a good deal could be done towards controlling the epidemics. The Air Force Routine Order on the subject stipulated that recruits were to be segregated in special quarters. In addition to being confined to barracks, they took their meals in a separate mess or at a different time from other personnel, and were barred from canteens, libraries, and public assemblies at the depot. The order further outlined a number of important medical procedures to be undertaken during the period of observation, some of which had been performed previous to the issue of the order. These included a daily examination for evidence of communicable disease

* see pp. 353-4.

(including Vincent's infection, scabies, and tinea infections of body and feet), routine serological tests, blood typing, the initiation of vaccination and other immunization procedures, a review of documentation and adjustment of any deficiencies such as the chest x-ray report, and instruction in first aid technique. It was during their period at manning depot that the airmen received lectures on health, hygiene, and venereal disease. Films on the latter subject were shown to recruits as part of the campaign to reduce the incidence of venereal disease in the service.

After manning depot the airmen were posted to a variety of stations depending on the work they were to do or the courses they were to undertake. On the stations the medical staff assumed responsibility for their care and treatment. Aircrew were sent to initial training school where once again medical personnel had an especially important task to perform over and above the general care of airmen. It was here that the final decision was made on what aircrew position the individual was to have. The medical factors were important in this respect, and one of the functions of the medical selection boards at I.T.Ss. was to assess these.* A careful physical recheck of each airman was carried out, and an effort was made to assess mental ability and personality. The president of the board was a representative on the selection board which met to consider all the relevant factors about the airman concerned and to determine his position in aircrew. It was at the initial training schools that airmen received their first test in the decompression chamber. Their capacity to take high altitudes and to ascend and descend at certain speeds was tested in these. After January 1942 some night vision testing was carried out at the initial training schools by women medical associates (ophthalmic assistants) who had received special training in this function.

During the remainder of the various aircrew courses, at elementary and service flying training schools and at air observer schools among others, there were no special medical functions to be carried out, but medical officers were nevertheless responsible for the day to day care of the airmen in these important stages of their training.

On completion of training, most aircrew were posted to the "Y" Depot in Halifax from where they proceeded to the United Kingdom. At "Y" Depot a final medical check was carried out in order to make certain of the man's physical state and to ensure that no disability liable to affect his efficiency had developed in the later stages of his training. Medical documents were brought up to date in order that the medical authorities who would be responsible for the care of aircrew overseas would have a complete picture of each man's medical history since his enlistment.

After 1942 a flying personnel medical section was located at "Y" Depot. This unit carried out a number of important medical tests on aircrew. One of these was a further test of the airman's ability to tolerate high altitudes.

* See pp. 448-50.

The men were exposed to 35,000 feet, and a note of their "ceiling" was made and placed in their documents. The latter practice was stopped on the insistence of R.A.F. authorities who maintained that it was hampering them in their task of distributing aircrew in the United Kingdom. It was stated that some aircrew used this evidence to back their claim to a different category. The unit also did some night vision testing. In addition, the blood grouping of all personnel passing through the "Y" Depot was determined.

With effect from 25 March 1943 an R.C.A.F. Service and Pay Book, form A47, Part I of which included medical data, was introduced for all R.C.A.F. personnel proceeding overseas. For most personnel "Y" Depot was the point at which the book was introduced. It was required that this book be carried by the individual on his person in order to provide a readily accessible source of information in the event that his records might not be available or that they might be delayed in transmission on posting. Both the Canadian Army and the R.A.F. provided precedents for the use of such a book. The medical section of the book provided space for information on the following subjects:

- (1) Medical classification (category)
- (2) Blood group
- (3) Night vision capacity
- (4) Immunization procedures
- (5) Prescription for spectacles
- (6) Surgical appliances issued
- (7) Miscellaneous medical entries

The S.M.O. at "Y" Depot, or at any unit from which personnel were to proceed overseas, was responsible for the completion of the medical section.

The embarkation medical officer at Halifax, who was responsible to the principal medical officer of Eastern Air Command, saw to the final arrangements at the time of embarkation. On the passage across the Atlantic a Canadian medical officer of one of the services was charged with the medical care of the airmen. With training completed and the airmen now ready for operations, direct Canadian responsibility for their medical care ceased, and the R.A.F. assumed this function.

The medical branch carried out its task with notable success. But its heavy responsibility in connection with the B.C.A.T.P. meant that its personnel had necessarily to be employed almost exclusively in home establishments. Once the idea had been accepted that Canada should administer the plan and that the R.C.A.F. medical branch would therefore handle the medical arrangements, it followed that the majority of the medical personnel would have to remain at the training schools in Canada. Although a limited number of R.A.F. medical officers were sent from the United Kingdom to staff

R.A.F. schools in the B.C.A.T.P., some R.C.A.F. medical officers were required for these. Moreover, there were many R.A.F. trainees, in addition to thousands of Australians and New Zealanders, at R.C.A.F. training schools, and their presence there meant that Canadian medical officers were held on these units. Finally, all the general medical administration of the plan was handled by R.C.A.F. medical personnel. This policy affected not only medical officers, but nursing sisters and ancillary medical personnel as well. As a result of it, only a small proportion of the personnel of the branch saw overseas service. When the peak number of R.C.A.F. medical officers overseas was reached, in June 1944, it represented only 18.3 per cent of the medical officer strength at that time.

A great deal of dissatisfaction resulted on the part of the personnel concerned especially as many had been assured that they would be posted overseas. Many resented the fact that they had to carry out routine medical duties for long periods on training stations, instead of having the opportunity to serve abroad where it was felt that medical experience would be greater or where they would feel they were participating more directly in the struggle. They thought that R.C.A.F. medical officers were being asked to take a greater share of the training phase than their counterparts in the Air Forces of the other participating nations. Their mental attitude was not improved when they compared their lot with that of navy and army medical officers, a greater proportion of whom experienced overseas service.

MEDICAL ARRANGEMENTS FOR R.A.F., R.A.A.F. AND R.N.Z.A.F. PERSONNEL

R.A.F. units were located in all the training commands except No. 3, and in Eastern and Western Air Commands. They fitted into the general administrative scheme and, apart from a few matters in which decisions rested with the United Kingdom Air Liaison Mission, they functioned in a manner similar to other units under the plan. The maximum number of R.A.F. units in operation in Canada was 27. This included ten service flying training schools, six elementary flying training schools, four operational training units, three air navigation schools, a bombing and gunnery school, a personnel depot, a radio school, and a general reconnaissance school.

On all the R.A.F. stations there was at least one R.A.F. medical officer, and in most cases where there were R.C.A.F. medical officers the latter were in a minority. On about half of these stations all the medical officers were R.A.F. Fifty-five R.A.F. medical officers were located on these units throughout the country in March 1943. Like his counterpart in R.C.A.F. units, the senior medical officer was responsible for advising the C.O. of his unit on the measures to be taken for the provision of proper medical care of personnel and for the prevention of disease, On professional questions he was responsible to the command principal medical officer who was in every case a

member of the R.C.A.F. A great part of the station medical officer's work centred inevitably around the station hospital, which was similar to those on R.C.A.F. stations. The total bed capacity of all of the R.A.F. units in March 1943 was 818. Facilities of R.C.A.F. convalescent hospitals were open to R.A.F. personnel.

In addition to the R.A.F. medical officers sent for station medical duties, there was one attached to the R.C.A.F. station at Trenton for a time. Others were sent from time to time for special duties, such as medical research. Late in 1941 a medical research officer was sent from the Royal Aircraft Experimental Establishment, Farnborough, England, to No. 1 Clinical Investigation Unit. An R.A.F. medical officer was attached to the United Kingdom Air Liaison Mission in Ottawa for liaison duty with the R.C.A.F. medical branch. No R.A.F. nursing sisters were sent to Canada, but a number of R.A.F. nursing orderlies were posted. The peak number of orderlies was reached in January 1944 when there were 269.

Airmen from the three other commonwealth nations participating in the plan went through the same training as did Canadian personnel. However, they took the early stages of this, manning depot and initial training school, in their own countries. Since some of the chief medical functions were carried out during these stages, some of the duties of R.C.A.F. medical officers were thereby curtailed. Nevertheless, a good deal remained to be done in general medical care and administration.

R.A.F. personnel became a Canadian responsibility upon arrival in Canada. They arrived as a rule at Halifax, but sometimes at New York or Montreal. They were sent first to No. 31 Personnel Depot in Moncton, N.B., from where they were posted to flying schools. Late in the war some R.A.F. airmen were sent directly to flying schools.

A full scale medical programme was carried out at No. 31 P.D. The same factors which caused the order for the quarantine of R.C.A.F. recruits on arrival at manning depot early in 1943 led to the adoption of a similar measure at Moncton later in the same year. In particular, the scarlet fever incidence was higher than anticipated in the summer of 1943 and investigation tended to indicate that the source of most of it had been incoming drafts of R.A.F. personnel. A ten-day period of quarantine was accordingly imposed for the purpose of observing potential contacts of infectious diseases, as well as for the institution of a testing and immunizing programme.

Early in 1941 it became a routine requirement that all R.A.F. personnel arriving in Canada should have a routine chest x-ray*. An analysis of the tuberculosis incidence and findings of chest x-rays among air force personnel in Canada early in 1942 yielded a strong validation of the x-ray programme and a most favourable tuberculosis incidence among R.C.A.F. personnel as compared with R.A.F. Arrangements were then made for the x-raying of R.A.F. personnel before coming to Canada.

* See Chapter 23, pp. 424-5, for the findings of these chest x-rays.

Medical responsibility for the R.A.F. at the flying schools consisted of the general care of personnel. After graduation, R.A.F. airmen were sent to No. 31 P.D. where their medical documents were brought up to date. R.A.F. medical documents were used for all R.A.F. personnel in Canada and medical officers were required to be familiar with these and the methods of completing and disposing of them.* Upon their return to the United Kingdom, R.A.F. personnel again became the responsibility of their own medical service.

Australians and New Zealanders also took their initial training in their own countries. They generally went directly to the flying schools on arrival in Canada. Medical arrangements for them were similar to those for the other B.C.A.T.P. personnel.

One of the tasks of the medical branch in regard to the Australians was to complete the R.C.A.F. immunization programme. As diphtheria and scarlet fever did not present a problem among recruits in the R.A.A.F., immunization against these two diseases was not prescribed in Australia. Serological tests for syphilis also were not routine procedure in the R.A.A.F. as they were in the R.C.A.F. An unsuccessful effort was made to have these inoculations carried out in Australia on the grounds that they caused considerable loss of training time in Canada. It was stated that R.A.A.F. personnel who came to Canada for training were selected at such short notice that sufficient time did not elapse to enable diphtheria and scarlet fever tests and inoculations to be completed before embarkation. The possibility of such inoculations being carried out during the voyage to Canada was explored but was decided to be impracticable. D.M.S. (Air) considered that the number of reactions to these inoculations after arrival in Canada was not sufficient to interfere seriously with training. It was suggested that the inoculations could be given at such a time as would not interfere unduly with the training programme.

R.A.F. medical documents were used for R.A.A.F. and R.N.Z.A.F. airmen serving in Canada until 1943 when Australia and New Zealand agreed to the use of R.C.A.F. documents for their personnel.* The latter arrangement greatly simplified procedure for the medical officers.

A number of medical problems arose when personnel from other parts of the Commonwealth were brought to Canada. Airmen from these lands often found it a problem to adapt themselves to the totally new environment in which they were placed. The widely different climate and eating habits posed problems in such matters as clothing, housing, feeding, and morale for the contingents from overseas. The medical branch helped in the solution of a number of these. The long, cold Canadian winter, in particular, created difficulties for airmen from overseas who were warned to exercise caution and protect themselves against its consequences. It was necessary to issue a

* Details of R.A.F., R.A.A.F. and R.N.Z.A.F. medical documentation arrangements in Canada are in Chapter 23, pp. 491-6.

new overcoat to Australian personnel, the one which had been provided for them at home proving too short for the severe winter weather they encountered in Canada.

Difficulties of adjustment on return to the United Kingdom were equally great, and posed problems for the R.A.F. medical authorities. In this case the difficulties applied to Canadian airmen as well. Men accustomed to plenty returned to a land in the midst of war and subject to numerous austerity measures. Those who had learned to fly with the space beneath them fully illuminated had now to fly under blackout conditions.

Following the discovery of a number of tuberculosis cases among R.A.F. personnel early in the period during which the plan operated, D.M.S. (Air) issued special instructions, in October 1941, governing the procedure to be adopted for these. These instructions were in accordance with British policy for R.A.F. tuberculosis cases. Those who would not be fit for duty within six months and who were fit to travel were to be returned to England after a medical board; those who were unfit to travel were to be given treatment in sanatoria at R.A.F. expense; cases which would be fit in six months were to continue treatment and then be boarded back to duty. Subsequently, it was ordered that these instructions were to apply to R.A.A.F. and R.N.Z.A.F. tuberculosis cases as well. Later still, in March 1942, a general policy was laid down for the disposal of all R.A.F. cases non-effective by reason of wound, injury, or disease. In this case, all personnel fit to travel were to be returned to the United Kingdom; those unfit to travel were to be treated in Canada until fit to return.

Difficulties arose in the following year with certain pulmonary tuberculosis cases transferred from Canada to the United Kingdom being treated by pneumothorax and undergoing periodic refills. With the delays in embarkation and the length of time taken in voyages to the United Kingdom it was difficult to ensure reasonable continuity of treatment where the period between refills was brief. A case occurred where a refill was due before the airman arrived at the port of disembarkation in the United Kingdom, and he later complained that the interruption in his treatment had probably adversely affected his chances of complete recovery. On the request of the Air Ministry, D.M.S. (Air) issued a circular order stating that cases undergoing this type of treatment were not to be embarked until the period between refills had been extended to 14 days. It was also stated that where there was no great urgency in returning the patients, they should be retained in Canada until capable of going for a period of 21 days without refills.

Problems concerning the medical boarding of commonwealth airmen, particularly R.A.F., arose from time to time. For example, an R.C.A.F. medical officer recently qualified would board an R.A.F. airman according to his best clinical judgement. He would make certain recommendations about the airman's disposal, but because of existing R.A.F. regulations it

was frequently impossible to carry out these recommendations. It was necessary, therefore, for all such medical boards to be studied and approved by an R.A.F. medical officer.

There was a problem, too, concerning R.A.F. medical personnel. Some of the nursing orderlies who were sent from England to help staff station hospitals had as many as nine years' experience in their trade. Because the regulations were such that none of these tradesmen could be promoted, relatively recently recruited R.C.A.F. N.C.Os. would be in charge of men of many years' experience. This caused difficulties which the medical liaison officer in Ottawa attempted to straighten out.

A further problem was that of medical attention and treatment of the families of R.A.F. personnel. The vexatious question of how this was to be provided dragged out for more than two years, and no satisfactory solution to it was ever found. In the United Kingdom extensive provisions were made for the care of airmen's dependents and a limited amount of attention was provided for officers' dependents, but these arrangements were not available in Canada with the result that families had to consult civil practitioners. As airmen were not required to budget for medical attention, their rate of pay being based, in part, on this, medical attention was frequently beyond their means and considerable financial embarrassment resulted. Repeated efforts were made to enable R.A.F. medical officers to treat airmen's dependents, but the obstacles in the way, primarily the cost of obtaining a provincial licence to practice, could not be surmounted.

An alternative solution to the problem was sought by having personnel join health insurance schemes through which the expense, in whole or in part, of medical and hospital treatment for their dependents could be met. An arrangement of this nature was made in August 1942 between No. 32 S.F.T.S., Moose Jaw, Saskatchewan, and the general hospital in that city and similar arrangements were made by four other R.A.F. stations in different parts of the country either, with local hospitals or with associations for medical and hospital care. In return for a small monthly payment hospitalization was provided for a certain number of days per year and a limited amount of medical care was given. But as fewer than one quarter of the R.A.F. stations in Canada were covered by these private arrangements by June 1943, a determined effort was made to obtain a Dominion-wide hospitalization scheme under one association embracing all R.A.F. units in Canada. Hopes for such a scheme foundered when one-of the regional associations disapproved of another plan entering the area it covered. Further attempts in this direction were unsuccessful and were abandoned in February 1944 by which time the decision had been taken to start closing a number of R.A.F. units.

Despite the failure of the plan for a hospitalization scheme and of the project whereby R.A.F. medical officers would be allowed to treat families, some progress was made towards bringing financial relief to airmen with sick dependents in Canada. Early in 1943 the supplementary grants for the

relief of financial distress among dependents of R.C.A.F. airmen below the rank of W.O.I were extended to apply to dependents resident in Canada of R.A.F., R.A.A.F., and R.N.Z.A.F. airmen of similar rank.

The same general policies governing the medical care of Canadians applied to Commonwealth personnel in Canada. With few exceptions these men came under the same plan, were subject to the same orders, regulations, and restrictions, and were offered the same facilities and treatment as Canadian airmen. When special medical problems involving them arose, the medical branch generally based its decisions on general policy as laid down by governmental and air force regulations of the country concerned. In the settlement of these problems, consultation was usually held with the Air Liaison Missions of the United Kingdom, Australia, and New Zealand, and, for the R.A.F., with the Deputy Air Member for Personnel, R.A.F., who was for a time in Canada charged with questions concerning British personnel. But for the execution of decisions the medical branch of the R.C.A.F. remained ultimately responsible under the Canadian commitment to provide medical care for the trainees and staff of the plan.

MEDICAL STATISTICS-B.C.A.T.P. PERSONNEL

PART A-ORGANIZATION AND ARRANGEMENTS RE MEDICAL RECORDS AND STATISTICS

The arrangements for the training of Australian, New Zealand, and United Kingdom personnel under the British Commonwealth Air Training Plan required the resolution of a number of problems in medical documentation and recording and also in the preparation of data for statistical purposes. The medical documentation procedures in the Royal Air Force, Royal Australian Air Force, and Royal New Zealand Air Force were all quite unlike those in the Royal Canadian Air Force and special arrangements, some of which were later modified, had to be made to meet the recording and the statistical requirements of the B.C.A.T.P. countries.

MEDICAL DOCUMENTATION AND RETURNS

Royal Air Force Personnel

Early in 1941, at the request of the Air Ministry, it was agreed that R.A.F. medical documentation would be used for all R.A.F. personnel in Canada, whether at R.A.F. or R.C.A.F. stations or units. This plan extended to the case records of all R.A.F. personnel treated in hospital or sick quarters and also to the medical documentation for medical board proceedings.

Under this arrangement, special R.A.F. (Can.) forms were printed for use in Canada for all R.A.F. personnel, including Forms 39, 41,42, 43,46, 47, 478, 496, 496A, 497, 657, 826, 827, 833, 847A, as well as MPB 204 and MPMSD 299.* Forms 39, 42, 46 and 826 were in duplicate, each consisting of a card and a flimsy copy. Until late in 1943, R.A.F. forms were also used for R.A.A.F. and R.N.Z.A.F. trainees.

Commencing in October 1941, arrangements were made whereby all R.A.F. Forms 39,42,46, and 826 were disposed of in accordance with R.A.F. procedure : flimsies were inserted in the Medical History Envelope, Form 48, and the card copies were sent monthly to D.M.S. (Air),

Throughout the war attention was continually directed to the importance of adhering to the R.A.F. medical documentation requirements and to the correct maintenance of the R.A.F. Medical History Envelope, Form 48, and the medical section of R.A.F. Form 64, Airman's Service and Pay Book. The procedures to be followed in the completion and disposal of each R.A.F. medical form in use in Canada were embodied in a special D.M.S. Circular Order. As a further aid to R.C.A.F. medical personnel, a special brochure

* For the titles of these and other forms referred to in this chapter see pp. 425-7.

on the use of R.A.F. medical forms was prepared. Special instructions were also provided to all principal medical officers regarding the procedure to be followed in preparing medical board proceedings for R.A.F. personnel.

At the close of the war, as a result of the stated preference of the Air Ministry, arrangements were made for the original clinical records on all R.A.F. personnel hospitalized while in Canada, which had been retained as office copies at the unit of origin, to be sent to R.C.A.F. Records Office at Air Force Headquarters, where they were filed by unit, by period. Later these records, together with any x-ray films, were sent to the Air Ministry. Under this policy, any residual R.A.A.F. and R.N.Z.A.F. medical documents were also passed to the Australian or New Zealand Air Liaison Mission.

Monthly Returns to Air Ministry

In order that medical statistics for R.A.F. personnel in Canada could be maintained, the Air Ministry also expressed, early in 1941, the hope that the R.C.A.F. medical branch might undertake to send regularly to the Air Ministry the card copies of R.A.F. Forms 39,42,46, and 826; a monthly return of patients treated in hospital, by station, for all R.A.F. personnel whether with R.A.F. or R.C.A.F. units; and weekly strengths by station for R.A.F. officers and airmen.

To meet this expressed requirement by the Air Ministry, arrangements were made for the preparation in Canada of separate monthly returns on R.A.F. personnel treated in hospital or sick quarters. In lieu of R.A.F. Form 38, Weekly Sick Return, copies of Form R.C.A.F. M32, Monthly Return of Patients Treated in Hospital or Sick Quarters, containing comparable details were used. Returns on this form were made for each R.A.F. unit and also for R.A.F. personnel at R.C.A.F. units. To complete the statistical requirements, strength statistics by unit for officers and airmen separately, as at the middle and end of each month were also prepared.

Commencing with returns for October 1941, card Forms 39,42,46, and 826 and nominal rolls thereof, together with monthly returns on Form M32, Monthly Return of Patients Treated in Hospital or Sick Quarters, and a covering letter with strength figures were sent monthly to the Air Ministry/ MA 3. This procedure was continued throughout the war and covered all R.A.F. personnel hospitalized in Canada, whether at R.A.F. or R.C.A.F. units.

Medical Documentation Control

The principal difficulties with the medical documentation of R.A.F. personnel were related to the arrival of such personnel in Canada without Form 48 and enclosures and to the repatriation of such personnel to the

United Kingdom without medical documents. While there was some improvement, the problem persisted for both east-bound and west-bound personnel.

Monthly checks on documentation were made on intake and output of personnel to Canada and towards the end of 1944 the situation had markedly improved. Late in 1943, the P.M.O., Eastern Air Command, observed that 99 per cent of Forms 48 for aircrew but only about 40 per cent of those for groundcrew were received with incoming drafts. Missing Forms 48 for aircrew were usually received in two or three weeks but it was sometimes several months before those for groundcrew arrived.

R.A.A.F. Personnel

From 1941 to 1943, R.A.F. medical documentation was also used for R.A.A.F. personnel. The original copies of case records on Forms R.A.F. 41, R.C.A.F. M33, M34, and M35, D.P. & N.H. Forms 100 and MFB 313A, as well as specialist and x-ray reports were required to be transcribed to R.A.F. Forms 39, the flimsy copies being inserted in the Form PM38, Medical Envelope, and the card copies sent to the P.M.O. at the end of the month and thence to D.M.S. (Air) as laid down in a special D.M.S. Circular Order. The original copies of the case record forms were required to be retained at the unit concerned.

Late in 1943, this arrangement was altered and R.C.A.F. medical documentation was adopted completely for all R.A.A.F. personnel while in Canada. This arrangement discontinued the use of R.A.F. Forms 39, 41, 42, 46 and 47 for these trainees and resulted in a great simplification of the medical documentation arrangements.

Under this new plan, upon the termination of hospitalization, all original clinical records were completed and a clinical summary prepared from the original clinical record of the case in the same fashion as for R.C.A.F. personnel using Form M53 in lieu of Form 39, as formerly. The clinical summary was inserted in the Medical Envelope and the original clinical records were sent to the principal medical officer concerned at the end of the month, with the regular monthly returns of patients treated in hospital or sick quarters (Forms M32).

On 29 May 1941 arrangements were concluded to provide the Australian Air Liaison Mission with monthly returns covering all R.A.A.F. personnel treated in hospital and sick quarters in Canada on copies of Form R.C.A.F. M32, Return of Patients Treated in Hospital or Sick Quarters.

To accomplish this, each P.M.O. was required to prepare separate and specially consolidated monthly returns in duplicate for all R.A.A.F. personnel treated in hospital or sick quarters during the month using the R.C.A.F. Monthly Return of Patients Treated in Hospital or Sick Quarters. The P.M.O. was also required to ensure that the card copies of R.A.F. Form 39,

and later, the original clinical records, were secured for all R.A.A.F. patients whose hospitalization was terminated during the month. These clinical records, together with the aforementioned monthly returns prepared by him, were sent to D.M.S. (Air) and immediately transmitted to the Australian Air Liaison Mission in Ottawa.

Beginning with June 1941, the specially prepared monthly returns of all R.A.A.F. personnel treated in hospital or sick quarters, setting out the essential details including command, diagnosis, dates of hospital stay, and disposition in each case, were transmitted to the A.A.L.O. with the relevant clinical records—R.A.F. card Forms 39 and later the original clinical records. Strength statistics were also supplied to the Australian Air Liaison Mission with these returns. Arrangements were also made for the notification about patients remaining in hospital over 14 days.

R.N.Z.A.F. Personnel

The medical documentation and statistical arrangements for R.N.Z.A.F. were essentially the same as for R.A.A.F. personnel.

From 1941 to 1943, R.A.F. medical documentation was also used for R.N.Z.A.F. personnel. Under this system the original medical records were retained and preserved as office records at the unit of origin in each case, the flimsy copies of the R.A.F. Forms 39, 42, 46, and 826 being inserted in the Medical Envelope and the card copies sent monthly to the principal medical officer concerned. From December 1943, R.C.A.F. medical documentation procedure, as described for R.A.A.F. personnel above, was adopted completely for all R.N.Z.A.F. personnel in Canada.

Throughout the war, special returns covering all R.N.Z.A.F. personnel hospitalized in Canada together with the relevant clinical records were sent each month to the New Zealand Air Liaison Mission for transmission to New Zealand. From 1941 to 1943 this comprised the R.A.F. card copies of Form 39, later the original clinical records, and, in addition, the separate copies of the R.C.A.F. Monthly Return of Patients in Hospital or Sick Quarters prepared as for R.A.F. and R.A.A.F. personnel, giving the essential details on hospitalization in each case. Arrangements were made to supply these returns in duplicate to the New Zealand Air Liaison Mission so that a copy could be sent to New Zealand and one copy retained in the Air Liaison Mission for reference. Special arrangements were also made for notification of the hospitalization of all personnel for periods in excess of 14 days.

Medical Documentation Problems-R.A.A.F. and R.N.Z.A.F.

Similar difficulties in medical documentation to those encountered with R.A.F. personnel were experienced with R.A.A.F. and R.N.Z.A.F. personnel.

One frequent difficulty encountered in the handling of medical documents for R.A.F., R.A.A.F., and R.N.Z.A.F. personnel was the lack of

authoritative information on the inoculation state of incoming drafts of trainees due to late arrival of medical documents. An attempt was made to obviate this difficulty for R.A.A.F. and R.N.Z.A.F. personnel by providing each trainee with a card setting out the inoculation state which could be presented on arrival in Canada, The New Zealand authorities adopted the use of Form R.C.A.F. M23, Immunization Card. In May 1944, the Australian authorities concurred in the adoption of R.C.A.F. card Form M23 as a temporary measure for setting out the inoculation state, pending the production of an R.A.A.F. card of a different colour which was to include night vision score, medical category, and blood group. Form R.C.A.F. M50, Sick Parade Record Card, was also taken into use since no corresponding form was available in the medical envelope of such personnel on arrival in Canada.

MEDICAL STATISTICS ON B.C.A.T.P. PERSONNEL

Throughout the war, separate monthly returns on patients treated in hospital and sick quarters were received by the R.C.A.F. Medical Statistics Section from all units and stations in Canada for R.A.F., R.A.A.F., and R.N.Z.A.F., as for R.C.A.F., personnel. These returns were routinely checked and the essential morbidity data coded on special code sheets and punched into specially designed Hollerith cards. Separate statistical tabulations were made routinely for each service by cause, the Standard Morbidity Code for Canada, as adapted for R.C.A.F. needs, being used for the classification of diseases and injuries. These tabulations provided the necessary detailed hospital morbidity statistics, including data on hospitalized cases of infectious disease.

In addition, Weekly Returns of Sick on Form M56, Monthly Returns of Venereal Disease, and Weekly Returns of Communicable Diseases on form M21, were sent to D.M.S. (Air) by each P.M.O. These returns provided separate data by station or unit for R.A.F., R.A.A.F., and R.N.Z.A.F. personnel. From these returns, statistics on a current basis for communicable disease and venereal disease were routinely compiled and published.

From 1941, current statistics on hospital morbidity, sick parade, venereal disease, and communicable disease, were regularly provided in a Monthly Statistical Report. Later, from January 1941, there was prepared in addition, a more comprehensive summary of health statistics under the title *Highlights on the Health of Air Force Personnel*, These reports were made available to all principal medical officers in Canada and also to the Australian and New Zealand Air Liaison Missions and to the Air Ministry. These reports included data on: current hospitalization by command; sick parade, sick leave, and excused duty; trends in hospitalization and in non-effective strength due to sickness; R.C.A.F. hospital facilities; convalescent hospital care; surgical operation statistics; current incidence and trends in infectious diseases;

mortality; and medical board proceedings. Many but not all of these data were presented separately for R.C.A.F., R.A.F., R.A.A.F., and R.N.Z.A.F. personnel.

LIAISON WITH B.C.A.T.P. COUNTRIES

Regular liaison was in effect throughout the war with B.C.A.T.P. countries and problems in medical documentation and medical statistics, of which there were many, were handled with the liaison medical officer concerned. Requests for special arrangements including medical records and medical statistics were implemented after discussion and there was never any serious difficulty in this field. The policy from the outset was to do everything possible to meet the requirements of the United Kingdom, Australian, and New Zealand Air Liaison Missions. Sometimes the solution was a compromise; sometimes interim agreed plans were modified later to simplify an agreed procedure.

PART B-HOSPITAL MORBIDITY STATISTICS

In this section are recorded certain of the hospital morbidity data for the period 1941 to 1944, inclusive, for R.A.F., R.A.A.F., and R.N.Z.A.F. personnel in the B.C.A.T.P. in Canada.

Source of Data

The hospital morbidity data presented herein were secured from wartime statistical tabulations prepared from the monthly returns on Form R.C.A.F. M32, Monthly Return of Patients Treated in Hospital or Sick Quarters, made by each air force unit or formation in Canada. These returns, similar in content to Form R.A.F. 38, provided essential facts about each case admitted to hospital, including the clinical diagnosis and period of hospital care.

Scope of the Data

For 1941 to 1943 the numbers of cases shown in the tables are the new admissions (excluding transfers and re-admissions) and the days of care are the hospital days during the period for all patients treated; for 1944 the figures given are the discharges and deaths (excluding re-admissions) during the year and the hospital days for all completed cases.

The morbidity statistics presented exclude personnel sick-in-quarters (few in number) and personnel treated at medical inspection rooms who did not require admission to hospital for treatment.

The R.A.F. statistics include Fleet Air Arm and Free French personnel attached to the R.A.F. in Canada.

Statistical Classification of the Causes of Morbidity

The statistical classification of diseases and injuries used in tabulating the morbidity data was, as for R.C.A.F. personnel, the Standard Morbidity Code for Canada, with some modifications to meet air force requirements. It was recognized that this classification, as a framework for tabulations of the causes of morbidity, possessed all the weaknesses and defects of the Fifth Revision of the International List of Causes of Death on which it was based, but it was adhered to in the interests of inter-service uniformity.

Definition of Terms

In presenting the morbidity data in this section, several of the more common measures are employed. The rates which are presented are regularly expressed on an annual basis.

Incidence — This term is used to refer to the volume of new cases, whether it be all causes or specific groups of causes, occurring within a specified period, and is expressed per 1000 mean strength at risk, per annum.

Absolute Admission or Discharge Rate — The number of admissions or discharges for all causes or for any given diagnosis category, per 1000 mean strength at risk, per annum.

Relative Admission or Discharge Rate — The percentage of cases of a given diagnosis category among all admissions or discharges during the period.

Absolute Wastage Rate — The number of days of hospital care for all causes or for any given diagnosis category per 1000 mean strength at risk, per annum.

Relative Wastage Rate — The percentage contributed by each diagnosis group to the total days in hospital for all cases.

Days of Care per Case — The arithmetic mean number of days of hospital care per new case in a given diagnosis group.

Daily Non-Effective Rate (D.N.E.R.) — The equivalent daily average number of personnel non-effective due to hospitalized sickness or injury during the year, per 1000 mean strength.

Limitations of the Data

The limitations of the wartime morbidity statistics relating to R.C.A.F. personnel are dealt with briefly in Volume II, Chapter 35. These limitations are common to most military morbidity statistics.

It is recognized that hospital admissions do not represent the sum of all sickness and injury in an armed force; many minor ailments are treated at medical inspection rooms. In some instances also, personnel are discharged from the service on medical grounds without ever being admitted to hospital. This is an important limitation of the data which should not be overlooked.

Statistical Tables

The detailed statistical tables are presented in three appendices to this section- A, B, and C. A component of each of these appendices sets out the particular data for R.A.F., K.A.A.F., and R.N.Z.A.F. personnel.

Basis of Rates

All rates presented in the morbidity tables are based on the mid-month strength figures provided by the R.C.A.F. Records Office wartime strength tabulations. The rates in all tables are expressed per 1000 strength per year to facilitate comparisons.

Total Volume of Morbidity

During the years 1941 to 1944, inclusive, there were 64,059 new admissions and 852,587 days of hospital care among R.A.F., R.A.A.F., and R.N.Z.A.F. personnel in Canada. In the succeeding paragraphs the highlights of this morbidity experience are discussed and salient statistics and comments presented.

Trends in Morbidity

A complete record of the trends in the incidence of hospitalized sickness and injury during the war is available. A consolidated summary of the cases, days of care, average length of stay in hospital, and daily non-effective rate is given by quarters in Appendices A-1, A-2, and A-3, for R.A.F., R.A.A.F., and R.N.Z.A.F. personnel respectively, for the period 1941 to 1944, inclusive. Similar data on the morbidity trends by month for the period 1941 to 1944 inclusive, are set out in Appendices B-1, B-2, and B-3.

A tabular summary of the trends in hospital morbidity experience for the four calendar years 1941 to 1944, inclusive, for R.A.F., R.A.A.F., and R.N.Z.A.F. personnel separately, is presented in Table I.

These data (Table I and the aforementioned detailed appendices) demonstrate a number of interesting points. The annual seasonal morbidity pattern for the three services was characteristic and similar to that for R.C.A.F. personnel to which attention is drawn in Volume II, Chapter 35 — highest rates of morbidity and wastage being attained quite regularly in the first or second quarter.

Over the period covered by the statistics presented, there was a clear-cut, long-term, downward trend in the admission rates. This decline in morbidity rates during the course of the war, to which attention is drawn in discussing the data for R.C.A.F. personnel, is a finding common to other military forces — a high incidence in the early mobilization period, lower rates following as *seasoned* troops formed a progressively increasing proportion of the total strength.

A similar downward trend in the wastage (days of care) rates, also shows up in the data for R.A.A.F. and R.N.Z.A.F. personnel as it does for R.C.A.F. personnel but is not to be found in the R.A.F. experience. Actually the wastage rates for R.A.F. personnel show a persistent increase over the four-year period 1941 to 1944. It is noteworthy that the average number

TABLE I
HOSPITAL MORBIDITY STATISTICS-1941 to 1944*
B.C.A.T.P. PERSONNEL IN CANADA

| YEAR | CASES † | | DAYS OF CARE ‡ | | Days of Care per Case | Average No. in Hospital Daily | DNER* |
|----------------------|---------|-------|----------------|--------|-----------------------|-------------------------------|-------|
| | Number | Rate* | Number | Rate* | | | |
| R.A.F. PERSONNEL | | | | | | | |
| 1941 | 6,234 | 577 | 74,460 | 6,891 | 12.0 | 204 | 19.0 |
| 1942 | 15,275 | 557 | 200,771 | 7,324 | 13.1 | 550 | 20.1 |
| 1943 | 20,023 | 564 | 270,666 | 7,632 | 13.5 | 742 | 20.9 |
| 1944 | 11,328 | 486 | 181,464 | 7,784 | 16.0 | 496 | 21.3 |
| 1941-1944 | 52,860 | 545 | 727,361 | 7,500 | 13.8 | 498 | 20.5 |
| R.A.A.F. PERSONNEL | | | | | | | |
| 1941 | 1,303 | 1,187 | 11,591 | 10,556 | 8.9 | 31.7 | 28.9 |
| 1942 | 1,034 | 840 | 11,595 | 9,423 | 11.2 | 31.8 | 25.8 |
| 1943 | 2,082 | 742 | 22,112 | 7,877 | 10.6 | 60.6 | 21.6 |
| 1944 | 1,523 | 647 | 19,726 | 8,376 | 13.0 | 53.9 | 22.9 |
| 1941-1944 | 5,942 | 793 | 65,024 | 8,679 | 10.9 | 44.5 | 23.6 |
| R.N.Z.A.F. PERSONNEL | | | | | | | |
| 1941 | 1,241 | 1,397 | 11,162 | 12,570 | 9.0 | 30.6 | 34.4 |
| 1942 | 1,477 | 1,102 | 17,880 | 13,343 | 12.1 | 49.0 | 36.6 |
| 1943 | 1,463 | 819 | 15,579 | 8,723 | 10.6 | 42.7 | 23.9 |
| 1944 | 1,076 | 624 | 60,202 | 9,032 | 14.5 | 42.6 | 24.7 |
| 1941-1944 | 5,257 | 916 | 60,202 | 10,496 | 11.5 | 41.2 | 28.7 |

* All rates are expressed per 1000 strength per year based on mid-month strength statistics prepared by R.C.A.F. Records Office. For example, the Daily Non-Effective Rate is the average number of men who were hospitalized daily during the period per 1000 strength per year.

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

of days of care per case steadily increased over the period covered by the statistics for B.C.A.T.P. personnel, such increase amounting to more than one-third of the average duration of stay per case in 1941.

The net effect of the changes in admission and wastage rates and duration of stay per case, is reflected in the daily non-effective rates for the three services which are included in Table I and Appendices A and B. These rates afford a useful index of wastage due to disease or injury and simply express the days of care in hospital in terms of the equivalent number of men non-effective daily due to hospitalization, expressed per thousand mean strength. The non-effective rates for R.A.F. personnel show a gradual though slight increase; the rates for R.A.A.F. and R.N.Z.A.F. personnel show a decline of 20 to 25 per cent.

The peak non-effective rate for R.A.F. personnel was actually not recorded until April and May 1943 when it reached 31 per thousand strength. During this period there was an outbreak of acute haemolytic streptococcal infections, including scarlet fever, among R.A.F. personnel. For R.A.A.F. personnel, the highest daily non-effective rates were recorded in January 1941 and January 1942 - the rates being 52 and 50 respectively, per thousand strength. For R.N.Z.A.F. personnel, peak daily non-effective rates were attained in February 1941 at 68 per thousand strength and in January 1942 at 76 per thousand strength.

Morbidity vs Wastage

While incidence rates provide important facts from the standpoint of medical service, wastage rates (days lost) and non-effective rates reflect more clearly the effective loss of manpower on account of sickness. Nevertheless, it is the number of individuals who are incapacitated that is significant and on this ground more emphasis should be placed on the frequency of occurrence (morbidity or incidence rates in the tables) than upon the days lost. Both type of indices are included in all of the tables.

Comparative Morbidity and Wastage

Throughout the period 1941 to 1944, both the morbidity (incidence) and wastage (days lost) rates for R.A.A.F. and R.N.Z.A.F. personnel were substantially higher than those for R.A.F. personnel and for R.C.A.F. personnel in Canada (Volume II, Chapter 35). The higher rates among R.A.A.F. and R.N.Z.A.F. personnel are particularly striking in 1941 and 1942 and were found to be associated with substantially greater admission rates for the acute upper respiratory infections and the common infectious diseases. In other words, the excessive rates were due in large measure to a higher incidence of airborne infections including infectious diseases, particularly mumps and scarlet fever. At certain periods during the war the admission, wastage, and non-effective rates per thousand strength for R.A.A.F. and R.N.Z.A.F. personnel were roughly twice as high as for other male air force personnel in the same area.

In interpreting these facts it is to be noted that the incidence of all infectious and communicable diseases is particularly high among personnel during their first three months following entry. For this reason the attack rates for the R.C.A.F. personnel are not strictly comparable with those for the other three services.

CHIEF CAUSES OF HOSPITALIZATION

The purpose of this section is to focus the attention of the reader on the causes of hospitalization which were of principal importance, in the sense of being most frequent or most prevalent. To accomplish this, detailed tables of selected causes have been prepared and these are presented in Appendices C-1, C-2, and C-3 for R.A.F., R.A.A.F., and R.N.Z.A.F.

personnel in Canada, respectively. In all of these tables the numbers of cases and days of care together with the morbidity, wastage, and daily non-effective rates are given. In addition to these detailed tables, three condensed tabulations of 30 chief causes are presented — Tables II-1, II-2, and II-3 — for R.A.F., R.A.A.F., and R.N.Z.A.F. personnel, respectively.*

TABLE II-1
CHIEF CAUSES OF HOSPITALIZATION-1941 to 1944
R.A.F. PERSONNEL IN CANADA

| DIAGNOSIS | CASES † | | | DAYS OF CARE ‡ | | | Days Per Case | DNER* |
|--|---------|-------|-------|----------------|-------|---------|---------------|-------|
| | Number | % | Rate* | Number | % | Rate* | | |
| Dis. tonsils & adenoids | 8,170 | 15.5 | 84.2 | 59,339 | 8.2 | 611.8 | 7.3 | 1.7 |
| Nasopharyngitis, coryza, rhinitis, pharyngitis | 8,067 | 15.3 | 83.1 | 45,721 | 6.3 | 471.4 | 5.7 | 1.3 |
| Diseases of skin & cellular tissue..... | 4,712 | 8.9 | 48.6 | 43,396 | 6.0 | 447.4 | 9.2 | 1.2 |
| Accidents, injuries, & other external violence | 4,370 | 8.3 | 45.1 | 72,953 | 10.0 | 752.2 | 16.7 | 2.1 |
| Influenza..... | 3,638 | 7.0 | 37.5 | 23,536 | 3.2 | 242.7 | 6.4 | 0.7 |
| Mumps, German measles, measles, chickenpox | 1,749 | 3.3 | 18.0 | 23,213 | 3.2 | 239.337 | 13.3 | 0.7 |
| Gonorrhoea..... | 1,739 | 3.3 | 17.9 | 36,801 | 5.2 | 9.4 | 20.5 | 1.0 |
| Scarlet fever..... | 1,557 | 2.9 | 16.1 | 44,242 | 6.1 | 456.2 | 28.4 | 1.2 |
| Gastroenteritis, colitis..... | 1,336 | 2.5 | 13.8 | 6,189 | 0.9 | 63.8 | 4.6 | 0.2 |
| Diseases of the ear..... | 1,271 | 2.4 | 13.1 | 16,382 | 2.3 | 168.9 | 12.9 | 0.4 |
| Appendicitis..... | 1,140 | 2.2 | 11.8 | 18,329 | 2.5 | 189.0 | 16.1 | 0.5 |
| Diseases of urethra (1)..... | 756 | 1.4 | 1.8 | 11,296 | 1.6 | 116.5 | 14.9 | 0.3 |
| Dis. organs of locomotion, bones & joints (2)..... | 724 | 1.4 | 7.5 | 15,554 | 2.1 | 160.4 | 21.5 | 0.4 |
| Bronchitis (3)..... | 714 | 1.4 | 7.4 | 8,119 | 1.1 | 83.7 | 11.4 | 0.3 |
| Vincent's infection..... | 710 | 1.3 | 7.3 | 5,618 | 0.8 | 58.0 | 7.9 | 0.2 |
| Haemorrhoids & varicose veins..... | 622 | 1.2 | 6.4 | 7,849 | 1.1 | 81.0 | 12.6 | 0.2 |
| Dis. male genital organs..... | 547 | 1.0 | 5.7 | 7,729 | 1.0 | 79.7 | 14.1 | 0.2 |
| Disease of buccal cavity..... | 527 | 1.0 | 5.4 | 3,899 | 0.5 | 40.2 | 7.4 | 0.1 |
| Dis. of accessory sinuses (4)..... | 510 | 1.0 | 5.3 | 6,406 | 0.9 | 66.1 | 12.6 | 0.2 |
| Psychiatric disorders (5)..... | 467 | 0.9 | 4.8 | 14,876 | 2.0 | 153.4 | 31.9 | 0.5 |
| Pneumonia (all forms) (6)..... | 462 | 0.8 | 4.8 | 12,212 | 1.7 | 125.9 | 26.4 | 0.3 |
| Tuberculosis (all forms)..... | 462 | 0.8 | 4.8 | 90,658 | 12.4 | 934.7 | 196.2 | 2.6 |
| Diseases of organs of vision..... | 438 | 0.8 | 4.5 | 5,188 | 0.7 | 53.5 | 11.8 | 0.2 |
| Rheumatic fever, acute..... | 369 | 0.7 | 3.8 | 26,473 | 3.7 | 273.0 | 71.7 | 0.8 |
| Gastritis, acute & chronic..... | 367 | 0.7 | 3.8 | 2,400 | 0.3 | 24.7 | 6.5 | 0.2 |
| Fibrositis, myalgia, sciatica, lumbago..... | 302 | 0.6 | 3.1 | 4,020 | 0.6 | 41.4 | 13.3 | 0.1 |
| Hernia..... | 267 | 0.5 | 2.8 | 8,757 | 1.2 | 90.3 | 32.8 | 0.2 |
| Rheumatoid arthritis & other arthritic conditions | 231 | 0.4 | 2.4 | 8,220 | 1.1 | 84.7 | 35.6 | 0.2 |
| Peptic ulcer..... | 230 | 0.4 | 2.4 | 7,195 | 1.0 | 74.2 | 31.3 | 0.2 |
| Fungus infections (7)..... | 222 | 0.4 | 2.3 | 3,014 | 0.4 | 31.1 | 13.6 | 0.1 |
| Total Specified Causes..... | 46,676 | 88.3 | 481.5 | 639,584 | 88.1 | 6,594.6 | 13.7 | 18.3 |
| Other Causes..... | 6,184 | 11.7 | 63.5 | 87,777 | 11.9 | 904.9 | 14.2 | 2.2 |
| GRAND TOTAL..... | 52,860 | 100.0 | 545.0 | 727,361 | 100.0 | 7,499.5 | 13.8 | 20.5 |

- (1) Includes non-specific urethritis. For 1943-44 there were 351 cases and 5513 days.
- (2) Excludes "arthritis" and "fibrositis".
- (3) Includes "acute", "chronic" and "bronchitis unspecified".
- (4) Includes barotrauma.
- (5) Includes psychoneuroses, psychoses and other psychiatric disorders.
- (6) Includes "bronchopneumonia", "lobar" and "pneumonia unspecified".
- (7) Includes ringworm, athlete's foot.

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, e.g. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization, per 1000 strength per year.

* It is to be noted that the expression "chief causes" is used here in the sense of indicating those causes which are of greatest frequency or prevalence; it has no other connotation than this.

TABLE II-2
CHIEF CAUSES OF HOSPITALIZATION-1941 to 1944
R.A.A.F. PERSONNEL IN CANADA

| DIAGNOSIS | CASES † | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|--|---------|-------|-------|---------------|-------|---------|---------------|-------|
| | Number | % | Rate* | Number | % | Rate* | | |
| Nasopharyngitis, coryza, rhinitis, pharyngitis | 1035 | 17.5 | 138.1 | 5,045 | 7.8 | 673.4 | 4.9 | 1.8 |
| Dis. tonsils & adenoids..... | 738 | 12.4 | 98.5 | 4,449 | 6.8 | 593.8 | 6.0 | 1.6 |
| Influenza..... | 599 | 10.1 | 80.0 | 3,327 | 5.1 | 444.1 | 55.5 | 1.2 |
| Mumps, German measles, measles, chickenpox..... | 562 | 9.4 | 75.0 | 7,609 | 11.7 | 1,015.7 | 13.5 | 2.8 |
| Accidents, injuries, & other external violence..... | 429 | 7.2 | 57.3 | 7,571 | 11.6 | 1,010.5 | 17.6 | 2.8 |
| Diseases of skin & cellular tissue..... | 377 | 6.3 | 50.3 | 2,218 | 3.4 | 296.1 | 5.9 | 0.8 |
| Diseases of the ear..... | 219 | 3.7 | 29.2 | 2,006 | 3.1 | 267.7 | 9.2 | 0.7 |
| Gonorrhoea..... | 163 | 2.7 | 21.8 | 3,746 | 5.8 | 500.0 | 23.0 | 1.4 |
| Appendicitis..... | 126 | 2.1 | 16.8 | 1,825 | 2.8 | 243.6 | 14.5 | 0.7 |
| Scarlet fever..... | 124 | 2.1 | 16.6 | 3,362 | 5.2 | 448.7 | 27.1 | 1.2 |
| Bronchitis (1)..... | 122 | 2.0 | 16.2 | 985 | 1.5 | 131.5 | 8.1 | 0.3 |
| Gastroenteritis, colitis..... | 102 | 1.7 | 13.6 | 434 | 0.7 | 57.9 | 4.3 | 0.2 |
| Diseases of urethra (2)..... | 83 | 1.4 | 11.1 | 1,211 | 1.9 | 161.7 | 14.6 | 0.4 |
| Dis. of accessory sinuses (3)..... | 79 | 1.3 | 10.6 | 742 | 1.1 | 99.0 | 9.4 | 0.3 |
| Vincent's infection..... | 71 | 1.2 | 9.5 | 469 | 0.7 | 62.6 | 6.6 | 0.2 |
| Pneumonia (all forms) (4)..... | 69 | 1.2 | 9.2 | 1,543 | 2.4 | 205.9 | 22.3 | 0.6 |
| Diseases of organs of vision..... | 48 | 0.8 | 6.4 | 451 | 0.7 | 60.2 | 9.4 | 0.2 |
| Gastritis, acute & chronic..... | 43 | 0.7 | 5.7 | 238 | 0.4 | 31.8 | 5.5 | 0.1 |
| Psychiatric disorders (5)..... | 41 | 0.7 | 5.5 | 581 | 0.9 | 77.5 | 14.2 | 0.1 |
| Peptic ulcer..... | 40 | 0.7 | 5.3 | 1,049 | 1.6 | 140.0 | 26.2 | 0.4 |
| Dis. male genital organs..... | 40 | 0.7 | 5.3 | 469 | 0.7 | 62.6 | 11.7 | 0.2 |
| Rheumatic fever, acute..... | 37 | 0.6 | 5.0 | 4,380 | 6.8 | 584.6 | 118.4 | 1.6 |
| Dis. organs of locomotion, bones and joints (6)..... | 36 | 0.6 | 4.8 | 640 | 1.0 | 85.4 | 17.8 | 0.2 |
| Fungus infections (7)..... | 35 | 0.6 | 4.7 | 338 | 0.5 | 45.1 | 9.7 | 0.1 |
| Hernia..... | 35 | 0.6 | 4.7 | 1,201 | 1.9 | 160.3 | 34.3 | 0.4 |
| Haemorrhoids & varicose veins..... | 27 | 0.5 | 3.6 | 269 | 0.4 | 35.9 | 10.0 | 0.1 |
| Rheumatoid arthritis and other arthritic conditions..... | 26 | 0.4 | 3.4 | 1,130 | 1.7 | 150.8 | 43.5 | 0.4 |
| Disease of buccal cavity..... | 21 | 0.4 | 2.8 | 105 | 0.2 | 14.0 | 5.0 | 0.0 |
| Fibrositis, myalgia, lumbago, sciatica..... | 17 | 0.3 | 2.3 | 286 | 0.4 | 38.2 | 16.8 | 0.1 |
| Tuberculosis (all forms)..... | 4 | 0.1 | 0.5 | 277 | 0.4 | 37.0 | 69.3 | 0.1 |
| Total Specified Causes..... | 5,348 | 90.0 | 713.8 | 57,956 | 89.2 | 7,735.6 | 10.8 | 21.0 |
| Other Causes..... | 594 | 10.0 | 79.3 | 7,068 | 10.8 | 943.5 | 11.9 | 2.6 |
| GRAND TOTAL..... | 5,942 | 100.0 | 793.1 | 65,024 | 100.0 | 8,679.1 | 10.9 | 23.6 |

(1) Includes "acute" "chronic" and "bronchitis unspecified".

(2) Includes non-specific urethritis. For 1943-44 there were 43 cases and 771 days.

(3) Includes barotrauma.

(4) Includes "bronchopneumonia", "lobar" and "pneumonia unspecified".

(5) Includes psychoneuroses psychoses and other psychiatric disorders.

(6) Excludes "arthritis" and "fibrositis".

(7) Includes ringworm, athlete's foot.

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

* All rates are expressed per 1000 strength per year based on R.C.A.F. Record? Office wartime strength tabulations, e.g. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization, per 1000 strength per year.

Selection of Causes for Presentation

The detailed cause tables for R.A.F., R.A.A.F., and R.N.Z.A.F. personnel which appear in the Appendices are set out on the same cause and cause-group basis as was used for R.C.A.F. personnel (Volume 11, Chapter 35).

Selection of causes or cause-groups to be included in the condensed tabulations of 30 chief causes presented was made on a basis similar to that adopted in setting up the comparable tables for R.C.A.F. personnel. Three

TABLE II-3
CHIEF CAUSES OF HOSPITALIZATION-1941 to 1944

| DIAGNOSIS | CASES† | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|--|--------------|--------------|--------------|---------------|--------------|-----------------|---------------|-------------|
| | Number | % | Rate* | Number | % | Rate* | | |
| Nasopharyngitis, coryza, rhinitis, pharyngitis | 916 | 17.4 | 159.7 | 4495 | 7.5 | 783.6 | 4.9 | 2.2 |
| Dis. tonsils & adenoids | 681 | 12.9 | 118.7 | 4391 | 7.4 | 765.5 | 6.4 | 2.1 |
| Mumps, German measles, measles, chickenpox | 626 | 11.9 | 109.3 | 8750 | 14.6 | 1,525.5 | 14.0 | 4.3 |
| Influenza | 570 | 10.9 | 99.4 | 3695 | 6.1 | 644.2 | 6.5 | 1.8 |
| Accidents, injuries, & other external violence | 381 | 7.3 | 66.4 | 5718 | 9.5 | 996.9 | 15.0 | 2.7 |
| Dis. of skin & cellular tissue | 338 | 6.3 | 58.9 | 2144 | 3.6 | 373.8 | 6.3 | 1.0 |
| Diseases of the ear | 177 | 3.4 | 30.9 | 1867 | 3.1 | 325.5 | 10.5 | 0.9 |
| Scarlet fever | 102 | 1.9 | 17.7 | 2862 | 4.8 | 499.0 | 14.2 | 1.4 |
| Bronchitis (1) | 97 | 1.9 | 17.0 | 993 | 1.6 | 173.0 | 10.2 | 0.4 |
| Gonorrhoea | 96 | 1.8 | 16.7 | 2032 | 3.4 | 354.2 | 29.5 | 1.0 |
| Gastroenteritis, colitis | 93 | 1.8 | 16.2 | 401 | 0.7 | 70.0 | 4.3 | 0.2 |
| Appendicitis | 89 | 1.7 | 15.5 | 1165 | 1.9 | 203.1 | 13.0 | 0.5 |
| Pneumonia (all forms) (2) | 81 | 1.5 | 14.0 | 1813 | 3.0 | 316.0 | 2.2 | 0.8 |
| Dis. of accessory sinuses (3) | 65 | 1.2 | 11.3 | 727 | 1.2 | 126.7 | 11.2 | 0.4 |
| Rheumatic fever, acute | 60 | 1.1 | 10.5 | 5708 | 9.5 | 995.1 | 95.1 | 2.7 |
| Dis. organs of locomotion, bones & joints (4) | 59 | 1.1 | 10.3 | 948 | 1.6 | 165.3 | 16.1 | 0.4 |
| Diseases of organs of vision | 42 | 0.8 | 7.3 | 549 | 0.9 | 95.7 | 13.1 | 0.3 |
| Dis. male genital organs | 39 | 0.7 | 6.8 | 498 | 0.8 | 86.8 | 12.8 | 0.2 |
| Diseases of urethra (5) | 37 | 0.7 | 6.5 | 412 | 0.7 | 71.8 | 11.1 | 0.2 |
| Psychiatric disorders (6) | 37 | 0.7 | 6.5 | 612 | 1.0 | 106.7 | 16.5 | 0.3 |
| Vincent's infection | 29 | 0.6 | 5.1 | 178 | 0.3 | 31.0 | 6.1 | 0.1 |
| Haemorrhoids & varicose veins | 28 | 0.6 | 4.8 | 277 | 0.5 | 48.3 | 9.9 | 0.1 |
| Gastritis, acute & chronic | 27 | 0.5 | 4.7 | 123 | 0.2 | 21.4 | 4.6 | 0.0 |
| Diseases of buccal cavity | 26 | 0.5 | 4.5 | 200 | 0.3 | 34.9 | 7.7 | 0.1 |
| Hernia | 19 | 0.4 | 3.3 | 545 | 0.9 | 95.0 | 28.7 | 0.2 |
| Rheumatoids arthritis & other arthritic conditions | 18 | 0.4 | 3.1 | 328 | 0.5 | 57.2 | 18.2 | 0.2 |
| Fibrositis, myalgia, lumbago, sciatica | 15 | 0.3 | 2.6 | 100 | 0.2 | 17.4 | 6.7 | 0.0 |
| Peptic ulcer | 15 | 0.3 | 2.6 | 379 | 0.6 | 66.1 | 25.3 | 0.2 |
| Tuberculosis (all forms) | 14 | 0.2 | 2.4 | 2415 | 4.0 | 421.0 | 17.3 | 1.1 |
| Fungus infections (7) | 11 | 0.2 | 1.9 | 103 | 0.2 | 18.0 | 11.4 | 0.0 |
| Total Specified Causes | 4,788 | 91.0 | 834.6 | 54,428 | 90.6 | 9,488.9 | 13.7 | 25.8 |
| Other Causes | 469 | 9.0 | 81.9 | 5,774 | 9.4 | 1,006.6 | 12.3 | 2.9 |
| GRAND TOTAL | 5,257 | 100.0 | 916.5 | 60,202 | 100.0 | 10,495.5 | 11.5 | 28.7 |

- (1) Includes "acute", "chronic" and "bronchitis unspecified".
- (2) Includes "bronchopneumonia", "lobar" and "pneumonia unspecified".
- (3) Includes barotrauma.
- (4) Excludes "arthritis" and "fibrositis".
- (5) Includes non-specific urethritis. For 1943-44 there were 20 cases and 246 days.
- (6) Includes psychoneuroses, psychoses and other psychiatric disorders.
- (7) Includes ringworm, athlete's foot.

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, e.g. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization, per 1000 strength per year.

considerations were involved: first, the need for a comparatively short list of causes; secondly, the principle that causes or cause-groups to be included should contribute a significant proportion of the total cases and day volume (say a minimum of 0.5 per cent of the total for all causes); and thirdly, the selection should be based on the R.A.F. morbidity experience because of its greater absolute volume, the corresponding tables for R.A.A.F. and R.N.Z.A.F. personnel being set up with the same cause-grouping.

The diagnosis data are, of course, subject to certain qualifications. For example, influenza is a clinical diagnosis, gonorrhoea includes urethritis believed but not necessarily proven to be gonococcal in origin; the tuberculosis figures include only those cases admitted to hospital for diagnosis or treatment before discharge; the data on cancer include leukaemia and Hodgkin's disease.

General Observations

The causes and cause-groups set out in the condensed tabulations of 30 chief causes cover the great bulk of both morbidity and wastage – in round figures 90 per cent in both instances for the personnel of each of the three services. This point is noteworthy in examining these tables in detail and particularly in making any comparisons between R.A.F., R.A.A.F., and R.N.Z.A.F. personnel and R.C.A.F. personnel.

The first six positions among the chief causes in the three services are held by the same cause-groups, although in different order. These six cause-groups are: nasopharyngitis, coryza, rhinitis, pharyngitis (common upper respiratory infections); disease of the tonsils and adenoids; mumps, German measles, measles and chickenpox; influenza; accidents, injuries and other external violence; and diseases of the skin and cellular tissue. These six cause-groups together contributed the following proportions of case and day volume: for R.A.F. personnel — 58.3 per cent of all cases and 36.9 per cent of all days of care; for R.A.A.F. personnel — 62.9 per cent of all cases and 46.4 per cent of all days; and for R.N.Z.A.F. personnel — 66.7 per cent of all cases and 48.7 per cent of all days of care.

Accidents, injuries, and other external violence proportionately contributed to a similar extent to the total morbidity picture — 8.3 per cent of cases and 10.0 per cent of days for R.A.F. personnel, compared with 7.2 per cent of cases and 11.6 per cent of days for R.A.A.F. personnel and 7.3 per cent of cases and 9.5 per cent of days for R.N.Z.A.F. personnel.

The four common infectious diseases of childhood — mumps, German measles, measles, and chickenpox - occupy a leading position in the total morbidity picture, as observed for R.C.A.F. personnel. It is further noted that, both absolutely and relatively, these four communicable diseases were of substantially greater importance among R.A.A.F. and R.N.Z.A.F. than they were among R.A.F. personnel. Actually the attack rates for these four diseases combined were four times as high among R.A.A.F. personnel and six times as high among R.N.Z.A.F. personnel as among R.A.F. personnel. There was little difference, however, in the attack rates for scarlet fever.

Psychiatric disorders contributed less than one per cent of all cases hospitalized in each of the three services. This proportion is substantially lower than that among R.C.A.F. personnel, the difference being due largely to the fact that R.A.F., R.A.A.F., and R.N.Z.A.F. personnel were made up almost entirely of aircrew trainees of flying personnel.

Tuberculosis (all forms) is included among the chief causes of morbidity and wastage in Table II but, as noted earlier, the figures do not include all cases but only those actually hospitalized. Tuberculosis was a much more significant contributor to the recorded hospital morbidity among R.A.F. personnel than it was among R.A.A.F., and R.N.Z.A.F. personnel.

Comparative Morbidity by Cause

Comparison of the data for R.A.F., R.A.A.F., and R.N.Z.A.F. personnel is facilitated by Table III in which the morbidity and wastage rates for the three services are set out together. The 30 chief causes in this table are presented in their order of importance among R.A.F. personnel.

TABLE III
COMPARATIVE INCIDENCE AND WASTAGE INDICES-1941 to 1944
R.A.F., R.A.A.F. AND R.N.Z.A.F. PERSONNEL IN CANADA

| DIAGNOSIS | MORBIDITY RATE* | | | WASTAGE RATE* | | |
|--|-----------------|--------------|--------------|---------------|--------------|---------------|
| | R.A.F. | R.A.A.F. | R.N.Z.A.F. | R.A.F. | R.A.A.F. | R.N.Z.A.F. |
| Diseases of tonsils & adenoids..... | 84.2 | 98.5 | 118.7 | 612 | 594 | 766 |
| Nasopharyngitis, coryza, rhinitis, pharyngitis | 83.1 | 138.1 | 159.7 | 471 | 673 | 784 |
| Diseases of skin & cellular tissue..... | 48.6 | 50.3 | 58.9 | 447 | 296 | 374 |
| Accidents, injuries & other external violence | 45.1 | 57.3 | 66.4 | 752 | 1,010 | 997 |
| Influenza..... | 37.5 | 80.0 | 99.4 | 243 | 444 | 644 |
| Mumps, German measles, measles, chickenpox | 18.0 | 75.0 | 109.3 | 239 | 1,016 | 1525 |
| Gonorrhoea..... | 17.9 | 21.8 | 16.7 | 379 | 500 | 354 |
| Scarlet fever..... | 16.1 | 16.6 | 17.7 | 456 | 449 | 499 |
| Gastroenteritis, colitis..... | 13.8 | 13.6 | 16.2 | 64 | 58 | 70 |
| Diseases of the ear..... | 13.1 | 29.2 | 30.9 | 169 | 268 | 326 |
| Appendicitis..... | 11.8 | 16.8 | 15.5 | 189 | 244 | 203 |
| Dis. of urethra (1)..... | 7.8 | 11.1 | 6.5 | 117 | 162 | 72 |
| Dis. of organs of locomotion, bones & joints (2)..... | 7.5 | 4.8 | 10.3 | 160 | 85 | 165 |
| Bronchitis (3)..... | 7.4 | 16.2 | 17.0 | 84 | 131 | 173 |
| Vincent's infection | 7.3 | 9.5 | 5.1 | 58 | 63 | 31 |
| Haemorrhoids & varicose veins | 6.4 | 3.6 | 4.8 | 81 | 36 | 48 |
| Diseases of male genital organs | 5.7 | 5.3 | 6.8 | 80 | 63 | 87 |
| Dis. of buccal cavity..... | 5.4 | 2.8 | 4.5 | 40 | 14 | 35 |
| Diseases of accessory sinuses (4)..... | 5.3 | 10.6 | 11.3 | 66 | 99 | 127 |
| Psychiatric disorders (5)..... | 4.8 | 5.5 | 6.5 | 154 | 77 | 107 |
| Pneumonia (all forms) (6)..... | 4.8 | 9.2 | 14.0 | 126 | 206 | 316 |
| Tuberculosis (all forms) | 4.8 | 0.5 | 2.4 | 935 | 37 | 421 |
| Diseases of organs of vision..... | 4.5 | 6.4 | 7.3 | 54 | 60 | 96 |
| Rheumatic fever, acute..... | 3.8 | 5.0 | 10.5 | 273 | 585 | 995 |
| Gastritis, acute & chronic..... | 3.8 | 5.7 | 4.7 | 25 | 32 | 21 |
| Fibrositis, myalgia, sciatica, lumbago..... | 3.1 | 2.3 | 2.6 | 41 | 38 | 17 |
| Hernia..... | 2.8 | 4.7 | 3.3 | 90 | 160 | 95 |
| Rheumatoid arthritis & other arthritic conditions | 2.4 | 3.4 | 3.1 | 85 | 151 | 57 |
| Peptic ulcer..... | 2.4 | 5.3 | 2.6 | 74 | 140 | 66 |
| Fungus infections (7)..... | 2.3 | 4.7 | 1.9 | 31 | 45 | 18 |
| Total Specified Causes..... | | | | | | |
| Other Causes..... | 481.5 | 713.8 | 834.6 | 6,595 | 7,736 | 9,489 |
| | 63.5 | 79.3 | 81.9 | 905 | 943 | 1,007 |
| GRAND TOTAL..... | 545.0 | 793.1 | 916.5 | 7,500 | 8,679 | 10,496 |

- (1) Includes non-specific urethritis.
- (2) Excludes "arthritis" and "fibrositis".
- (3) Includes "acute", "chronic" and "bronchitis unspecified".
- (4) Includes harotrauma.
- (5) Includes psychoneuroses, psychoses and other psychiatric disorders.
- (6) Includes "bronchopneumonia", lobar" and "pneumonia unspecified".
- (7) Includes ringworm, athlete's foot.

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations; the "morbidity rate" is the number of cases per 1000 mean strength per year and the "wastage rate" is the number of days of hospital care per 1000 mean strength per year.

The significant absolute and relative differences between the total morbidity and wastage rates for R.A.F. compared with R.A.A.F. and R.N.Z.A.F. personnel are to a large extent due to higher rates in the latter two services for the acute respiratory and infectious disease categories. Smaller excesses are noted in most of the other cause-groups; in fact, in only very few instances - varicose veins and tuberculosis, for example - is this picture reversed.

Minor Morbidity-Sick Parade Data

In addition to the morbidity and wastage represented by those persons who were sufficiently disabled to be admitted to hospital for treatment for disease or injury, as for R.C.A.F. personnel, there were a great many cases of minor sickness and injury which never reached hospital but which were seen by the medical officer on sick parade or in medical inspection rooms. While these personnel were not sufficiently disabled to be admitted to hospital, they were momentarily non-effective to the service. Some of them were sufficiently incapacitated to be designated as "attend C", that is "attend for treatment and excused all duties".

A summary of the recorded sick parade experience for R.A.F., R.A.A.F., and R.N.Z.A.F. personnel during the period from 26 June 1943 to 21 June 1944, inclusive, is presented in Table IV.

TABLE IV
SICK PARADE EXPERIENCE-B.C.A.T.P. PERSONNEL IN CANADA

| PERIOD | R.A.F. | | R.A.A.F. | | R.N.Z.A.F. | |
|-------------------------|---------|-------|----------|-------|------------|-------|
| | Number | Rate* | Number | Rate* | Number | Rate* |
| 26 Jun.-22 Sep. 1943 | 36516 | 76.1 | 2739 | 73.0 | 1631 | 68.0 |
| 23 Sep.-22 Dec. 1943 | 40850 | 84.5 | 3299 | 88.7 | 2107 | 91.0 |
| 23 Dec.-22 Mar. 1944 | 30653 | 73.8 | 3141 | 89.1 | 1765 | 73.6 |
| 23 Mar.-21 Jun. 1944 | 24129 | 72.1 | 3387 | 102.1 | 2230 | 85.5 |
| TOTAL..... | 132,148 | 77.1 | 12,566 | 87.8 | 7,733 | 79.6 |

* Rates are expressed as "sick parade attendances per thousand strength per week".

Source: Weekly Returns of Sick on Form M56 from all Principal Medical Officers in Canada.

The volume of sick parade expressed per thousand strength per week does not show any particularly striking differences. On the average, during the selected period, 7.7 per cent of R.A.F. personnel, 8.8 per cent of R.A.A.F. personnel, and 8.0 per cent of R.N.Z.A.F. personnel appeared on sick parade each week. These figures are equivalent to sick parade loads of 4.0 attendances on sick parade per man per year for R.A.F. personnel, 4.6 for R.A.A.F. personnel, and 4.1 attendances per man per year for R.N.Z.A.F. personnel.

APPENDIX A-1
QUARTERLY HOSPITAL MORBIDITY STATISTICS—1941 to 1944
R.A.F. PERSONNEL IN CANADA

| YEAR | Quarter | CASES* | | DAYS OF CARE‡ | | Days Per Case | Average No. in Hospital Daily | DNER † |
|------|---------|--------|-------|---------------|--------|---------------|-------------------------------|--------|
| | | Number | Rate† | Number | Rate† | | | |
| 1941 | 1st | 1,035 | 795 | 9,730 | 7,470 | 9.4 | 108 | 20.4 |
| | 2nd | 1,121 | 586 | 14,456 | 7,560 | 12.9 | 157 | 20.7 |
| | 3rd | 1,708 | 583 | 19,725 | 6,730 | 11.5 | 214 | 18.4 |
| | 4th | 2,370 | 511 | 30,549 | 6,588 | 12.9 | 332 | 18.0 |
| | TOTAL | 6,234 | 577 | 74,460 | 6,891 | 12.0 | 204 | 19.0 |
| 1942 | 1st | 4,521 | 836 | 51,158 | 9,457 | 11.3 | 568 | 25.9 |
| | 2nd | 4,007 | 601 | 54,397 | 8,164 | 13.6 | 591 | 22.4 |
| | 3rd | 3,442 | 477 | 47,912 | 6,645 | 13.9 | 520 | 18.2 |
| | 4th | 3,305 | 413 | 47,304 | 5,908 | 14.3 | 514 | 16.2 |
| | TOTAL | 15,275 | 557 | 200,771 | 7,324 | 13.1 | 550 | 20.1 |
| 1943 | 1st | 5,682 | 702 | 64,928 | 8,018 | 11.4 | 721 | 21.9 |
| | 2nd | 6,102 | 699 | 90,314 | 10,354 | 14.8 | 992 | 28.3 |
| | 3rd | 3,502 | 380 | 56,549 | 6,141 | 16.1 | 621 | 16.8 |
| | 4th | 4,737 | 511 | 58,883 | 6,355 | 12.4 | 647 | 17.4 |
| | TOTAL | 20,023 | 564 | 270,666 | 7,632 | 13.5 | 742 | 20.9 |
| 1944 | 1st | 4,444 | 556 | 54,458 | 6,819 | 12.2 | 598 | 18.6 |
| | 2nd | 3,618 | 563 | 59,876 | 9,000 | 16.0 | 636 | 24.6 |
| | 3rd | 2,099 | 383 | 41,480 | 7,570 | 19.8 | 451 | 20.7 |
| | 4th | 1,167 | 342 | 27,650 | 8,097 | 23.7 | 490 | 22.1 |
| | TOTAL | 11,328 | 486 | 181,464 | 7,784 | 16.0 | 496 | 21.3 |

† All rates are expressed per 1000 strength per year based on mid-month strength statistics prepared by R.C.A.F. Records Office. For example, the Daily Non-Effective Rate is the average number of men who were hospitalized daily during the period per 1000 strength per year.

* Cases for 1941 to 1943 inclusive are new admissions (transfers and readmissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

APPENDIX B-1
MONTHLY HOSPITAL MORBIDITY STATISTICS—1941 to 1944
R.A.F. PERSONNEL IN CANADA

| YEAR | Month | CASES* | | DAYS OF CARE | | Days of Care Per Case | Average No. in Hospital Daily | DNER‡ |
|------|-------|--------|--------|--------------|---------|-----------------------|-------------------------------|-------|
| | | Number | Rate† | Number | Rate† | | | |
| 1941 | Jan. | 313 | 841 | 2,340 | 6,289 | 7.5 | 75 | 17.2 |
| | Feb. | 323 | 735 | 3,122 | 7,664 | 9.7 | 111 | 21.0 |
| | Mar. | 399 | 769 | 4,268 | 8,226 | 10.7 | 138 | 22.5 |
| | Apr. | 392 | 688 | 5,035 | 8,894 | 12.8 | 168 | 24.4 |
| | May | 312 | 520 | 4,421 | 7,376 | 14.2 | 143 | 20.2 |
| | Jun. | 417 | 569 | 5,000 | 6,865 | 12.0 | 167 | 18.8 |
| | Jul. | 452 | 538 | 5,353 | 6,371 | 11.8 | 173 | 17.4 |
| | Aug. | 557 | 545 | 6,325 | 6,188 | 11.3 | 204 | 16.9 |
| | Sep. | 699 | 637 | 8,047 | 7,375 | 11.5 | 268 | 20.2 |
| | Oct. | 742 | 499 | 9,585 | 6,448 | 12.9 | 309 | 17.7 |
| | Nov. | 734 | 487 | 9,526 | 6,362 | 13.0 | 318 | 17.4 |
| | Dec. | 894 | 527 | 11,438 | 6,744 | 12.8 | 369 | 18.5 |
| | TOTAL | | 6,234 | 577 | 74,460 | 6,819 | 12.0 | 204 |
| 1942 | Jan. | 1,362 | 795 | 14,220 | 8,305 | 10.4 | 459 | 22.7 |
| | Feb. | 1,440 | 851 | 16,888 | 9,986 | 11.7 | 603 | 27.3 |
| | Mar. | 1,719 | 864 | 20,050 | 8,542 | 11.7 | 647 | 23.4 |
| | Apr. | 1,627 | 742 | 20,436 | 9,316 | 12.5 | 681 | 25.5 |
| | May | 1,333 | 597 | 18,677 | 8,363 | 14.0 | 602 | 22.9 |
| | Jun. | 1,047 | 470 | 15,284 | 6,863 | 14.6 | 509 | 18.8 |
| | Jul. | 1,080 | 445 | 15,988 | 6,582 | 14.8 | 516 | 18.0 |
| | Aug. | 1,186 | 503 | 15,794 | 6,701 | 13.3 | 509 | 18.4 |
| | Sep. | 1,176 | 473 | 16,130 | 6,488 | 13.7 | 538 | 17.7 |
| | Oct. | 1,164 | 442 | 16,237 | 5,976 | 14.0 | 524 | 16.4 |
| | Nov. | 1,060 | 409 | 15,796 | 6,096 | 15.0 | 526 | 16.7 |
| | Dec. | 1,081 | 389 | 15,271 | 5,506 | 14.1 | 493 | 15.1 |
| | TOTAL | | 15,275 | 557 | 200,771 | 7,324 | 13.1 | 550 |
| 1943 | Jan. | 1,387 | 514 | 18,436 | 6,837 | 13.3 | 595 | 18.7 |
| | Feb. | 1,865 | 732 | 20,371 | 8,002 | 10.9 | 728 | 21.9 |
| | Mar. | 2,430 | 859 | 16,121 | 9,238 | 10.7 | 843 | 25.3 |
| | Apr. | 2,422 | 841 | 31,969 | 11,111 | 13.2 | 1,066 | 30.4 |
| | May | 2,327 | 776 | 33,977 | 11,133 | 14.6 | 1,096 | 31.0 |
| | Jun. | 1,353 | 476 | 24,360 | 8,584 | 18.0 | 812 | 23.5 |
| | Jul. | 1,267 | 427 | 20,363 | 6,868 | 16.1 | 657 | 18.8 |
| | Aug. | 1,154 | 356 | 19,133 | 5,914 | 16.6 | 617 | 16.2 |
| | Sep. | 1,081 | 349 | 17,053 | 5,516 | 15.8 | 568 | 15.1 |
| | Oct. | 1,141 | 369 | 17,733 | 5,738 | 15.5 | 572 | 15.7 |
| | Nov. | 1,614 | 511 | 19,466 | 6,169 | 12.1 | 649 | 16.9 |
| | Dec. | 1,982 | 639 | 21,684 | 6,990 | 11.0 | 699 | 19.1 |
| | TOTAL | | 20,023 | 564 | 270,666 | 7,632 | 13.5 | 742 |
| 1944 | Jan. | 1,424 | 478 | 17,094 | 5,744 | 12.0 | 551 | 15.7 |
| | Feb. | 1,435 | 532 | 17,787 | 6,598 | 12.4 | 613 | 18.0 |
| | Mar. | 1,585 | 700 | 19,577 | 8,652 | 12.3 | 632 | 23.6 |
| | Apr. | 1,494 | 684 | 23,070 | 10,567 | 15.4 | 769 | 28.9 |
| | May | 1,246 | 581 | 19,932 | 9,295 | 16.0 | 642 | 25.4 |
| | Jun. | 878 | 424 | 14,874 | 7,193 | 16.9 | 496 | 19.6 |
| | Jul. | 735 | 375 | 11,093 | 5,666 | 15.1 | 358 | 15.5 |
| | Aug. | 758 | 396 | 13,138 | 6,878 | 17.3 | 424 | 18.8 |
| | Sep. | 606 | 368 | 17,249 | 10,500 | 28.5 | 575 | 28.7 |
| | Oct. | 511 | 368 | 11,614 | 8,353 | 22.7 | 375 | 22.8 |
| | Nov. | 382 | 337 | 8,241 | 7,271 | 21.6 | 275 | 19.9 |
| | Dec. | 274 | 300 | 7,795 | 8,562 | 28.4 | 251 | 23.4 |
| | TOTAL | | 11,328 | 486 | 181,464 | 7,784 | 16.0 | 496 |

† All rates are expressed per 1000 strength per year based on mid-month strength statistics prepared by R.C.A.F. Records Office. For example, the Daily Non-Effective Rate is the average number of men who were hospitalized daily during the period per 1000 strength per year.

* Cases for 1941 to 1943 inclusive are new admissions (transfers and readmissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

APPENDIX C-1

CHIEF CAUSES OF HOSPITALIZATION
R.A.F. PERSONNEL IN CANADA—1941 to 1944

| DIAGNOSIS | CASES† | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|---|--------|------|-------|---------------|------|---------|---------------|-------|
| | Number | % | Rate* | Number | % | Rate* | | |
| CLASS I – INFECTIVE AND PARASITIC DISEASES | | | | | | | | |
| Measles | 314 | 0.6 | 3.2 | 4,235 | 0.6 | 43.7 | 13.5 | 0.1 |
| Scarlet fever | 1,557 | 2.9 | 16.1 | 44,242 | 6.1 | 456.2 | 28.4 | 1.2 |
| Diphtheria | 11 | 0.0 | 0.1 | 351 | 0.0 | 3.6 | 31.9 | 0.0 |
| Influenza | 3,638 | 7.0 | 37.5 | 23,536 | 3.2 | 242.7 | 6.4 | 0.7 |
| Meningococcal meningitis | 14 | 0.0 | 0.1 | 391 | 0.1 | 4.0 | 27.9 | 0.0 |
| Tuberculosis, respiratory | 437 | 0.8 | 4.5 | 86,922 | 11.9 | 896.2 | 198.9 | 2.5 |
| Tuberculosis, other forms | 25 | 0.0 | 0.3 | 3,736 | 0.5 | 38.5 | 149.4 | 0.1 |
| Syphilis (1) | 141 | 0.3 | 1.5 | 3,705 | 0.5 | 38.2 | 26.3 | 0.1 |
| Gonorrhoea | 1,739 | 3.3 | 17.9 | 36,801 | 5.2 | 379.4 | 20.5 | 1.0 |
| Chickenpox | 349 | 0.7 | 3.6 | 5,455 | 0.7 | 56.2 | 15.6 | 0.2 |
| German measles | 538 | 1.0 | 5.5 | 4,261 | 0.6 | 43.9 | 7.9 | 0.1 |
| Mumps | 548 | 1.0 | 5.7 | 9,262 | 1.3 | 95.5 | 16.9 | 0.3 |
| Other infections (2) | 222 | 0.4 | 2.3 | 3,014 | 0.4 | 31.1 | 13.6 | 0.1 |
| Others in this class | 243 | 0.5 | 2.5 | 5,401 | 0.7 | 55.7 | 22.2 | 0.1 |
| TOTAL CLASS I | 9,776 | 18.5 | 100.8 | 231,312 | 31.8 | 2,384.9 | 23.7 | 6.5 |
| CLASS II – NEOPLASMS | | | | | | | | |
| Malignant neoplasms (3) | 17 | 0.0 | 0.2 | 1,191 | 0.2 | 12.3 | 70.1 | 0.0 |
| Other neoplasms | 198 | 0.4 | 2.0 | 2,828 | 0.4 | 29.1 | 14.3 | 0.1 |
| TOTAL CLASS II | 215 | 0.4 | 2.2 | 4,019 | 0.6 | 41.4 | 18.7 | 0.1 |
| CLASS III – RHEUMATIC DISEASES DISEASES OF NUTRITION ENDOCRINE GLANDS and other GENERAL DISEASES | | | | | | | | |
| Rheumatic fever | | | | | | | | |
| Rheumatoid arthritis | 369 | 0.7 | 3.8 | 26,473 | 3.7 | 273.0 | 71.7 | 0.8 |
| Other arthritic conditions | 53 | 0.1 | 0.6 | 1,643 | 0.2 | 16.9 | 31.0 | 0.0 |
| Fibrositis, myalgia, lumbago, sciatica | 178 | 0.3 | 1.8 | 6,577 | 0.9 | 67.8 | 36.9 | 0.2 |
| Others in this class | 302 | 0.6 | 3.1 | 4,020 | 0.6 | 41.4 | 13.3 | 0.1 |
| | 110 | 0.2 | 1.1 | 2,478 | 0.3 | 25.6 | 22.5 | 0.1 |
| TOTAL CLASS III | 1,012 | 1.9 | 10.4 | 41,191 | 5.7 | 424.7 | 40.7 | 1.2 |
| CLASS IV – DISEASES OF BLOOD AND BLOOD-FORMING ORGANS.. | | | | | | | | |
| | 27 | 0.1 | 0.3 | 787 | 0.1 | 8.1 | 29.1 | 0.0 |
| CLASS V – CHRONIC POISONING AND INTOXICATION | | | | | | | | |
| | 22 | 0.0 | 0.2 | 185 | 0.0 | 1.9 | 8.4 | 0.0 |
| CLASS VI – DISEASES OF THE NERVOUS SYSTEM | | | | | | | | |
| Psychoneuroses | 309 | 0.6 | 3.2 | 6,730 | 0.9 | 69.4 | 21.7 | 0.2 |
| Psychoses | 80 | 0.2 | 0.8 | 6,084 | 0.8 | 62.7 | 76.0 | 0.2 |
| Other psychiatric disorders | 78 | 0.1 | 0.8 | 2,062 | 0.3 | 21.3 | 26.4 | 0.1 |
| Epilepsy | 21 | 0.0 | 0.2 | 301 | 0.0 | 3.1 | 14.3 | 0.0 |
| Other dis. nervous system | 188 | 0.4 | 1.9 | 3,621 | 0.5 | 37.3 | 19.3 | 0.1 |
| Conjunctiva | 275 | 0.5 | 2.8 | 2,207 | 0.3 | 22.8 | 8.0 | 0.1 |
| Other dis. organs vision | 163 | 0.3 | 1.7 | 2,981 | 0.4 | 30.7 | 18.3 | 0.1 |
| Otitis media | 983 | 1.9 | 10.1 | 12,360 | 1.7 | 127.4 | 12.6 | 0.3 |
| Other ear conditions | 288 | 0.5 | 3.0 | 4,022 | 0.6 | 41.5 | 14.0 | 0.1 |
| NYD, other than mental | 54 | 0.1 | 0.6 | 1,230 | 0.2 | 12.7 | 22.8 | 0.0 |
| TOTAL CLASS VI | 2,439 | 4.6 | 25.1 | 41,598 | 5.7 | 428.9 | 17.1 | 1.2 |

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, e.g. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization, per 1000 strength per year.

(1) Includes neurosyphilis and cardiovascular syphilis.

(2) Includes ringworm, athlete's foot.

(3) Includes leukaemia and Hodgkin's disease.

APPENDIX C-1 (cont'd.)

CHIEF CAUSES OF HOSPITALIZATION
R.A.F. PERSONNEL IN CANADA—1941 to 1944

| DIAGNOSIS | CASES † | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|--|---------------|-------------|--------------|----------------|-------------|----------------|---------------|------------|
| | Number | % | Rate* | Number | % | Rate* | | |
| CLASS VII – DISEASES OF THE CIRCULATORY SYSTEM | | | | | | | | |
| Diseases of the heart | 83 | 0.2 | 0.8 | 3,146 | 0.4 | 32.4 | 37.9 | 0.1 |
| Haemorrhoids | 361 | 0.7 | 3.7 | 4,189 | 0.6 | 43.2 | 11.6 | 0.1 |
| Varicose veins | 261 | 0.5 | 2.7 | 3,660 | 0.5 | 37.8 | 14.0 | 0.1 |
| Other dis. arteries & veins | 77 | 0.1 | 0.8 | 1,061 | 0.1 | 10.9 | 13.8 | 0.0 |
| Others in this class | 355 | 0.7 | 3.7 | 3,993 | 0.6 | 41.2 | 11.2 | 0.1 |
| TOTAL CLASS VII | 1,137 | 2.2 | 11.7 | 16,049 | 2.2 | 165.5 | 14.1 | 0.4 |
| CLASS VIII – DISEASES OF THE RESPIRATORY SYSTEM | | | | | | | | |
| Coryza, rhinitis, naso-pharyngitis, pharyngitis | 8,067 | 15.3 | 83.1 | 45,721 | 6.3 | 471.4 | 5.7 | 1.3 |
| Deviated septum | 181 | 0.3 | 1.9 | 1,928 | 0.3 | 19.9 | 10.6 | 0.0 |
| Diseases of accessory sinuses (1) | 510 | 1.0 | 5.3 | 6,406 | 0.9 | 66.1 | 12.6 | 0.2 |
| Bronchitis, acute | 307 | 0.6 | 3.2 | 3,064 | 0.4 | 31.6 | 10.9 | 0.1 |
| Bronchitis, chronic & n.s. | 407 | 0.8 | 4.2 | 5,055 | 0.7 | 52.1 | 12.4 | 0.2 |
| Bronchopneumonia | 115 | 0.2 | 1.2 | 3,457 | 0.5 | 35.7 | 30.1 | 0.1 |
| Lobar pneumonia | 162 | 0.3 | 1.7 | 4,611 | 0.6 | 47.5 | 28.5 | 0.1 |
| Pneumonia, unspecified | 185 | 0.3 | 1.9 | 4,144 | 0.6 | 42.7 | 22.4 | 0.1 |
| Pleurisy | 205 | 0.4 | 2.1 | 7,828 | 1.0 | 80.7 | 38.2 | 0.2 |
| Asthma, hay fever | 108 | 0.2 | 1.1 | 2,202 | 0.3 | 22.7 | 20.4 | 0.1 |
| Others in this class | 1,432 | 2.7 | 14.7 | 12,310 | 1.7 | 126.9 | 8.6 | 0.3 |
| TOTAL CLASS VIII | 11,679 | 22.1 | 120.4 | 96,726 | 13.3 | 997.3 | 8.3 | 2.7 |
| CLASS IX – DISEASES OF THE DIGESTIVE SYSTEM | | | | | | | | |
| Disease of buccal cavity | 527 | 1.0 | 5.4 | 3,899 | 0.5 | 40.2 | 7.4 | 0.1 |
| Disease of tonsils & adenoids | 8,170 | 15.5 | 84.2 | 59,339 | 8.2 | 611.8 | 7.3 | 1.7 |
| Vincent's infection | 710 | 1.3 | 7.3 | 5,618 | 0.8 | 58.0 | 7.9 | 0.2 |
| Peptic ulcer | 230 | 0.4 | 2.4 | 7,195 | 1.0 | 74.2 | 31.3 | 0.2 |
| Gastritis, acute & chronic | 367 | 0.7 | 3.8 | 2,400 | 0.3 | 24.7 | 6.5 | 0.2 |
| Other disease of stomach | 102 | 0.2 | 1.1 | 1,405 | 0.2 | 14.5 | 13.8 | 0.0 |
| Gastroenteritis, colitis | 1,336 | 2.5 | 13.8 | 6,189 | 0.9 | 63.8 | 4.6 | 0.2 |
| Appendicitis | 1,140 | 2.2 | 11.8 | 18,329 | 2.5 | 189.0 | 16.1 | 0.5 |
| Hernia | 267 | 0.5 | 2.8 | 8,757 | 1.2 | 90.3 | 32.8 | 0.2 |
| Diseases of anus and rectum | 92 | 0.2 | 0.9 | 1,605 | 0.2 | 16.5 | 17.4 | 0.0 |
| Diseases of liver | 105 | 0.2 | 1.1 | 2,137 | 0.3 | 22.0 | 20.3 | 0.1 |
| Diseases of gall bladder | 51 | 0.1 | 0.5 | 890 | 0.1 | 9.2 | 17.4 | 0.0 |
| Others in this class | 585 | 1.1 | 6.0 | 7,562 | 1.0 | 78.0 | 12.9 | 0.2 |
| TOTAL CLASS IX | 13,682 | 25.9 | 141.1 | 125,325 | 17.2 | 1,292.2 | 9.2 | 3.6 |
| CLASS X – DISEASES OF THE GENITO-URINARY SYSTEM | | | | | | | | |
| Diseases of kidney & ureter | 167 | 0.3 | 1.7 | 5,180 | 0.7 | 53.4 | 30.1 | 0.1 |
| Diseases of bladder | 214 | 0.4 | 2.2 | 2,860 | 0.4 | 29.5 | 13.4 | 0.1 |
| Dis. of male genital organs | 547 | 1.0 | 5.7 | 7,729 | 1.0 | 79.7 | 14.1 | 0.2 |
| Dis. of urethra (2) | 756 | 1.4 | 7.8 | 11,296 | 1.6 | 116.5 | 14.9 | 0.3 |
| Others in this class | 137 | 0.3 | 1.4 | 2,028 | 0.3 | 20.9 | 14.8 | 0.1 |
| TOTAL CLASS X | 1,821 | 3.4 | 18.8 | 29,093 | 4.0 | 300.0 | 16.0 | 0.8 |

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, e.g. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization per 1000 strength per year.

(1) Includes barotrauma.

(2) Includes non-specific urethritis. For 1943-44—351 cases and 5513 days.

APPENDIX C-1 (cont'd.)

CHIEF CAUSES OF HOSPITALIZATION
R.A.F. PERSONNEL IN CANADA-1941 to 1944

| DIAGNOSIS | CASES† | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|---|--------|-------|-------|---------------|-------|---------|---------------|-------|
| | Number | % | Rate* | Number | % | Rate* | | |
| CLASS XII – DISEASES of the SKIN AND CELLULAR TISSUE | | | | | | | | |
| Boils and carbuncles | 1,154 | 2.2 | 11.9 | 81.7 | 1.0 | 83.6 | 7.0 | 0.2 |
| Cellulitis | 1,297 | 2.5 | 13.4 | 10,842 | 1.5 | 111.8 | 8.4 | 0.3 |
| Scabies..... | 718 | 1.3 | 7.4 | 4,179 | 0.6 | 43.1 | 5.8 | 0.1 |
| Others in this class (1)..... | 1,543 | 2.9 | 15.9 | 20,268 | 2.9 | 208.9 | 13.1 | 0.6 |
| TOTAL CLASS XII..... | 4,712 | 8.9 | 48.6 | 43,396 | 6.0 | 447.4 | 9.2 | 1.2 |
| CLASS XIII – DISEASES of the BONES AND ORGANS OF LOCOMOTION | | | | | | | | |
| Diseases of the bones | 91 | 0.2 | 0.9 | 3,891 | 0.5 | 40.1 | 42.8 | 0.1 |
| Diseases of the joints..... | 326 | 0.6 | 3.4 | 6,528 | 0.9 | 67.3 | 20.0 | 0.2 |
| Dis. of organs of locomotion..... | 307 | 0.6 | 3.2 | 5,135 | 0.7 | 53.0 | 16.7 | 0.1 |
| TOTAL CLASS XIII | 724 | 1.4 | 7.5 | 15,554 | 2.1 | 160.4 | 21.5 | 0.4 |
| CLASS XIV – CONGENITAL MALFORMATIONS (2)..... | 48 | 0.1 | 0.5 | 1,160 | 0.2 | 12.0 | 24.2 | 0.0 |
| CLASS XVII – ACCIDENTS, INJURIES, AND OTHER EXTERNAL VIOLENCE | | | | | | | | |
| Fractures | 1,201 | 2.3 | 12.4 | 38,072 | 5.3 | 392.5 | 31.7 | 1.1 |
| Dislocations..... | 122 | 0.2 | 1.3 | 2,122 | 0.3 | 21.9 | 17.4 | 0.1 |
| Burns and scalds..... | 158 | 0.3 | 1.6 | 2,578 | 0.3 | 26.6 | 16.3 | 0.1 |
| Cuts, lacerations, contusions..... | 865 | 1.6 | 8.9 | 6,810 | 0.9 | 70.2 | 7.9 | 0.2 |
| Sprains, strains, joint injury | 728 | 1.4 | 7.5 | 6,117 | 0.8 | 63.1 | 8.4 | 0.2 |
| Foreign bodies..... | 50 | 0.1 | 0.5 | 982 | 0.1 | 10.1 | 19.6 | 0.0 |
| Concussions..... | 279 | 0.5 | 2.9 | 4,037 | 0.6 | 41.6 | 14.5 | 0.1 |
| Others in this class | 967 | 1.8 | 10.0 | 12,235 | 1.7 | 126.2 | 12.6 | 0.3 |
| TOTAL CLASS XVII..... | 4,370 | 8.3 | 45.1 | 72,953 | 10.0 | 752.2 | 16.7 | 2.1 |
| CLASS XVIII – ILL-DEFINED CONDITIONS | 659 | 1.2 | 6.8 | 6,087 | 0.8 | 62.8 | 9.2 | 0.2 |
| CLASS XIX – PREVENTATIVE MEDICAL CARE..... | 537 | 1.0 | 5.5 | 1,926 | 0.3 | 19.8 | 3.6 | 0.1 |
| GRAND TOTAL | 52,860 | 100.0 | 545.0 | 727,361 | 100.0 | 7,499.5 | 13.8 | 20.5 |

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days or care for 1941 to 1948 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, e.g. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization per 1000 strength per year.

(1) Includes impetigo. For 1942-44 there were 266 cases and 3767 days.

(2) Includes pilonidal sinus. For 1943-44 there were 17 cases and 511 days.

APPENDIX A-2

QUARTERLY HOSPITAL MORBIDITY STATISTICS—1941 to 1944
R.A.A.F. PERSONNEL IN CANADA

| YEAR | Quarter | CASES* | | DAYS OF CARE‡ | | Days of Care Per Case | Average No. in Hospital Daily | DNER† |
|------|-----------------|--------|-------|---------------|--------|-----------------------|-------------------------------|-------|
| | | Number | Rate† | Number | Rate† | | | |
| 1941 | 1 st | 301 | 1,516 | 2,490 | 12,542 | 8.3 | 27.6 | 34.4 |
| | 2 nd | 354 | 1,180 | 3,208 | 10,693 | 9.1 | 35.2 | 29.3 |
| | 3 rd | 300 | 978 | 2,859 | 9,319 | 9.5 | 31.0 | 25.5 |
| | 4 th | 348 | 1,185 | 3,034 | 10,296 | 8.7 | 33.0 | 28.2 |
| | TOTAL | 1,303 | 1,187 | 11,591 | 10,556 | 8.9 | 31.7 | 28.9 |
| 1942 | 1 st | 260 | 1,290 | 3,137 | 15,570 | 12.1 | 34.8 | 42.6 |
| | 2 nd | 110 | 607 | 1,843 | 10,165 | 16.7 | 20.2 | 27.8 |
| | 3 rd | 225 | 688 | 2,547 | 7,790 | 11.3 | 27.7 | 21.3 |
| | 4 th | 439 | 838 | 4,068 | 7,705 | 9.3 | 44.2 | 21.1 |
| | TOTAL | 1,034 | 840 | 11,595 | 9,423 | 11.2 | 31.8 | 25.8 |
| 1943 | 1 st | 584 | 929 | 6,123 | 9,737 | 10.5 | 68.0 | 26.7 |
| | 2 nd | 614 | 839 | 6,951 | 9,500 | 11.3 | 76.4 | 26.0 |
| | 3 rd | 395 | 543 | 4,517 | 6,211 | 11.4 | 49.6 | 17.0 |
| | 4 th | 489 | 679 | 4,521 | 6,280 | 9.2 | 49.1 | 26.5 |
| | TOTAL | 2,082 | 742 | 22,112 | 7,877 | 10.6 | 60.6 | 21.6 |
| 1944 | 1 st | 473 | 708 | 5,453 | 8,166 | 11.5 | 60.0 | 22.3 |
| | 2 nd | 514 | 808 | 7,122 | 11,195 | 13.8 | 78.3 | 30.7 |
| | 3 rd | 338 | 456 | 4,343 | 5,855 | 12.8 | 47.2 | 16.0 |
| | 4 th | 198 | 418 | 2,808 | 5,936 | 14.1 | 30.5 | 16.2 |
| | TOTAL | 1,523 | 647 | 19,726 | 8,376 | 13.0 | 53.9 | 22.9 |

† All rates are expressed per 1000 strength per year based on mid-month strength statistics prepared by R.C.A.F. Records Office. For example, the Daily Non-Effective Rate is the average number of men who were hospitalized daily during the period per 1000 strength per year.

* Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

APPENDIX B-2

MONTHLY HOSPITAL MORBIDITY STATISTICS—1941 to 1944
R.A.A.F. PERSONNEL IN CANADA

| YEAR | Month | CASES* | | DAYS OF CARE‡ | | Days of Care Per Case | Average No. in Hospital Daily | DNER† |
|------|-------|--------|-------|---------------|--------|-----------------------|-------------------------------|-------|
| | | Number | Rate† | Number | Rate† | | | |
| 1941 | Jan. | 112 | 2,443 | 876 | 19,107 | 7.8 | 28.2 | 25.3 |
| | Feb. | 71 | 1,097 | 630 | 9,734 | 8.8 | 23.5 | 26.7 |
| | Mar. | 118 | 1,347 | 984 | 11,229 | 8.3 | 31.7 | 31.0 |
| | Apr. | 138 | 1,416 | 1,104 | 11,329 | 8.0 | 36.8 | 31.0 |
| | May | 134 | 1,276 | 1,009 | 9,609 | 7.5 | 32.5 | 26.3 |
| | Jun. | 82 | 841 | 1,095 | 11,227 | 13.3 | 36.5 | 33.0 |
| | Jul. | 101 | 996 | 841 | 8,297 | 8.3 | 27.1 | 22.7 |
| | Aug. | 86 | 846 | 908 | 8,936 | 10.5 | 29.2 | 24.5 |
| | Sep. | 113 | 1,091 | 1,110 | 10,712 | 9.8 | 37.0 | 29.3 |
| | Oct. | 115 | 1,138 | 1,119 | 11,077 | 9.7 | 36.0 | 30.3 |
| | Nov. | 103 | 1,047 | 878 | 8,927 | 8.5 | 29.2 | 24.4 |
| | Dec. | 130 | 1,383 | 1,037 | 11,034 | 7.9 | 33.4 | 30.2 |
| | TOTAL | | 1,303 | 1,187 | 11,591 | 10,556 | 8.9 | 31.7 |
| 1942 | Jan. | 114 | 1,453 | 1,439 | 18,337 | 12.6 | 46.4 | 50.2 |
| | Feb. | 77 | 1,190 | 921 | 14,229 | 11.9 | 32.8 | 39.0 |
| | Mar. | 69 | 1,189 | 777 | 13,385 | 11.2 | 25.0 | 36.7 |
| | Apr. | 26 | 502 | 654 | 12,623 | 25.1 | 21.8 | 34.5 |
| | May | 5 | 830 | 639 | 11,781 | 14.2 | 20.6 | 32.3 |
| | Jun. | 39 | 520 | 550 | 7,334 | 14.1 | 18.3 | 20.1 |
| | Jul. | 70 | 788 | 806 | 9,075 | 11.5 | 26.0 | 24.9 |
| | Aug. | 60 | 588 | 814 | 7,978 | 13.5 | 26.2 | 21.9 |
| | Sep. | 95 | 703 | 927 | 6,861 | 9.7 | 30.9 | 18.8 |
| | Oct. | 116 | 789 | 1,122 | 7,635 | 9.6 | 36.1 | 20.9 |
| | Nov. | 144 | 887 | 1,245 | 7,673 | 8.6 | 41.5 | 21.0 |
| | Dec. | 179 | 834 | 1,701 | 7,948 | 9.5 | 55.0 | 21.8 |
| | TOTAL | | 1,034 | 840 | 11,595 | 9,423 | 11.2 | 31.8 |
| 1943 | Jan. | 167 | 844 | 1,754 | 8,864 | 10.5 | 56.5 | 24.3 |
| | Feb. | 180 | 918 | 1,709 | 8,716 | 9.4 | 61.0 | 24.0 |
| | Mar. | 237 | 1,011 | 2,660 | 11,347 | 11.2 | 85.8 | 31.1 |
| | Apr. | 212 | 864 | 2,466 | 10,053 | 11.6 | 82.2 | 27.5 |
| | May | 230 | 924 | 2,562 | 10,290 | 11.1 | 82.6 | 28.2 |
| | Jun. | 172 | 726 | 1,923 | 8,113 | 11.1 | 64.1 | 22.2 |
| | Jul. | 141 | 589 | 1,637 | 6,839 | 11.5 | 52.8 | 19.0 |
| | Aug. | 145 | 572 | 1,530 | 6,036 | 10.5 | 49.3 | 16.5 |
| | Sep. | 109 | 466 | 1,350 | 5,767 | 12.3 | 45.0 | 16.0 |
| | Oct. | 128 | 545 | 1,413 | 6,019 | 11.0 | 45.5 | 16.5 |
| | Nov. | 203 | 876 | 1,703 | 7,351 | 8.3 | 56.7 | 20.1 |
| | Dec. | 158 | 624 | 1,405 | 5,551 | 8.8 | 45.3 | 15.2 |
| | TOTAL | | 2,082 | 742 | 22,112 | 7,877 | 10.6 | 60.6 |
| 1944 | Jan. | 105 | 463 | 763 | 3,364 | 7.2 | 24.6 | 9.2 |
| | Feb. | 170 | 800 | 1,838 | 8,647 | 10.8 | 63.3 | 24.0 |
| | Mar. | 198 | 870 | 2,852 | 12,529 | 14.4 | 92.0 | 34.2 |
| | Apr. | 173 | 796 | 2,560 | 11,773 | 14.7 | 85.3 | 32.2 |
| | May | 203 | 974 | 2,806 | 13,470 | 13.8 | 90.5 | 36.8 |
| | Jun. | 138 | 658 | 1,756 | 8,370 | 12.7 | 58.5 | 22.9 |
| | Jul. | 100 | 496 | 1,406 | 6,980 | 14.0 | 45.3 | 19.1 |
| | Aug. | 142 | 604 | 1,847 | 9,266 | 13.0 | 59.5 | 25.3 |
| | Sep. | 96 | 555 | 1,090 | 6,296 | 11.3 | 36.3 | 17.2 |
| | Oct. | 92 | 579 | 1,218 | 7,660 | 13.2 | 39.2 | 21.0 |
| | Nov. | 59 | 372 | 782 | 4,937 | 13.2 | 26.0 | 13.5 |
| | Dec. | 47 | 303 | 808 | 4,893 | 17.1 | 26.0 | 13.4 |
| | TOTAL | | 1,523 | 647 | 19,726 | 8,376 | 13.0 | 53.9 |

† All rates are expressed per 1000 strength per year based on mid-month strength statistics prepared by R.C.A.F. Records Office. For example, the Daily Non-Effective Rate is the average number of men who were hospitalized daily during the period per 1000 strength per year.

* Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

APPENDIX C-2

CHIEF CAUSES OF HOSPITALIZATION
R.A.A.F. PERSONNEL IN CANADA—1941 to 1944

| DIAGNOSIS | CASES† | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|--|--------------|-------------|--------------|---------------|-------------|----------------|---------------|------------|
| | Number | % | Rate* | Number | % | Rate* | | |
| CLASS I – INFECTIVE AND PARASITIC DISEASES | | | | | | | | |
| Measles | 81 | 1.4 | 10.8 | 841 | 1.3 | 112.3 | 10.4 | 0.3 |
| Scarlet fever | 124 | 2.1 | 16.6 | 3,362 | 5.2 | 448.7 | 27.1 | 1.2 |
| Influenza | 599 | 10.1 | 80.0 | 3,327 | 5.1 | 444.1 | 55.5 | 1.2 |
| Meningococcal meningitis | 1 | 0.0 | 0.1 | 31 | 0.0 | 4.1 | 31.0 | 0.0 |
| Tuberculosis, respiratory | 4 | 0.1 | 0.5 | 277 | 0.4 | 37.0 | 69.3 | 0.3 |
| Tuberculosis, other forms | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Syphilis (1) | 18 | 0.3 | 2.4 | 338 | 0.5 | 45.1 | 18.8 | 0.1 |
| Gonorrhoea | 163 | 2.7 | 21.8 | 3,746 | 5.8 | 500.0 | 23.0 | 1.4 |
| Diphtheria | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Chickenpox | 84 | 1.4 | 11.2 | 1,205 | 1.9 | 160.8 | 14.3 | 0.4 |
| German measles | 62 | 1.0 | 8.3 | 402 | 0.6 | 53.7 | 6.5 | 0.2 |
| Mumps | 335 | 5.6 | 44.7 | 5,161 | 7.9 | 688.9 | 15.4 | 1.9 |
| Fungus infections (2) | 35 | 0.6 | 4.7 | 338 | 0.5 | 45.1 | 9.7 | 0.1 |
| Others in this class | 35 | 0.6 | 4.7 | 480 | 0.7 | 64.1 | 13.7 | 0.2 |
| TOTAL CLASS I | 1,541 | 25.9 | 205.8 | 19,508 | 29.9 | 2,603.9 | 12.7 | 7.1 |
| CLASS II – NEOPLASMS | | | | | | | | |
| Malignant neoplasms (3) | 2 | 0.0 | 0.3 | 70 | 0.1 | 9.3 | 35.0 | 0.0 |
| Other neoplasms | 14 | 0.2 | 1.8 | 96 | 0.1 | 12.8 | 6.9 | 0.0 |
| TOTAL CLASS II | 16 | 0.3 | 2.1 | 166 | 0.2 | 22.1 | 10.4 | 0.1 |
| CLASS III – RHEUMATIC DISEASES | | | | | | | | |
| DISEASES OF NUTRITION | | | | | | | | |
| ENDOCRINE GLANDS and OTHER | | | | | | | | |
| GENERAL DISEASES | | | | | | | | |
| Rheumatic fever | 37 | 0.6 | 5.0 | 4,380 | 6.8 | 584.6 | 118. | 1.6 |
| Rheumatoid arthritis | 7 | 0.1 | 0.9 | 672 | 1.0 | 89.7 | 4 | 0.2 |
| Other arthritic conditions | 9 | 0.3 | 2.5 | 458 | 0.7 | 61.1 | 96.0 | 0.2 |
| Fibrositis, myalgia, lumago, sciatica | 17 | 0.3 | 2.3 | 286 | 0.4 | 38.2 | 24.1 | 0.1 |
| Others in this class | 18 | 0.3 | 2.4 | 483 | 0.8 | 64.5 | 16.8 | 0.2 |
| TOTAL CLASS III | 98 | 1.6 | 13.1 | 6,279 | 9.7 | 838.1 | 19.8 | 2.3 |
| CLASS IV – DISEASES OF BLOOD AND BLOOD-FORMING ORGANS | | | | | | | | |
| TOTAL CLASS IV | 2 | 0.0 | 0.3 | 100 | 0.2 | 13.3 | 50.0 | 0.0 |
| CLASS V – CHRONIC POISONING AND INTOXICATION | | | | | | | | |
| TOTAL CLASS V | 1 | 0.0 | 0.1 | 20 | 0.0 | 2.7 | 20.0 | 0.0 |
| CLASS VI – DISEASES OF THE NERVOUS SYSTEM | | | | | | | | |
| Psychoneuroses | 31 | 0.5 | 4.2 | 367 | 0.6 | 49.0 | 11.8 | 0.1 |
| Psychoses | 4 | 0.1 | 0.5 | 128 | 0.2 | 17.0 | 32.0 | 0.0 |
| Other psychiatric disorders | 6 | 0.1 | 0.8 | 86 | 0.1 | 11.5 | 14.3 | 0.0 |
| Epilepsy | 3 | 0.0 | 0.4 | 35 | 0.0 | 4.7 | 11.7 | 0.0 |
| Other dis. of nervous system | 15 | 0.3 | 2.0 | 173 | 0.3 | 23.1 | 11.5 | 0.1 |
| Conjunctiva | 38 | 0.6 | 5.1 | 281 | 0.4 | 37.5 | 7.4 | 0.1 |
| Other dis. of organs of vision | 10 | 0.2 | 1.3 | 170 | 0.3 | 22.7 | 17.0 | 0.1 |
| Otitis media | 173 | 2.9 | 23.1 | 1,682 | 2.6 | 224.5 | 9.7 | 0.6 |
| Other ear conditions | 46 | 0.8 | 6.1 | 324 | 0.5 | 43.2 | 7.0 | 1.0 |
| NYD, other than mental | 4 | 0.1 | 0.5 | 41 | 0.1 | 5.5 | 10.3 | 0.0 |
| TOTAL CLASS VI | 330 | 5.6 | 44.0 | 3,287 | 5.1 | 438.7 | 10.0 | 1.1 |

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, e.g. the D.N.E.U. is the average daily number of men who were non-effective due to hospitalization, per 1000 strength per year.

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

(1) Includes neurosyphilis and cardiovascular syphilis.

(2) Includes ringworm, athlete's foot.

(3) Includes leukaemia and Hodgkin's disease.

APPENDIX C-2 (cont'd.)

CHIEF CAUSES OF HOSPITALIZATION
R.A.A.F. PERSONNEL IN CANADA—1941 to 1944

| DIAGNOSIS | CASES† | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|---|--------------|-------------|--------------|---------------|-------------|----------------|---------------|------------|
| | Number | % | Rate* | Number | % | Rate* | | |
| CLASS VII – DISEASES of the CIRCULATORY SYSTEM | | | | | | | | |
| Diseases of the heart..... | 1 | 0.0 | 0.1 | 9 | 0.0 | 1.2 | 9.0 | 0.0 |
| Haemorrhoids..... | 16 | 0.3 | 0.2 | 141 | 0.2 | 18.8 | 8.8 | 0.1 |
| Varicose veins..... | 11 | 0.2 | 1.5 | 128 | 0.2 | 17.1 | 11.6 | 0.0 |
| Other dis. of arteries and veins..... | 6 | 0.1 | 0.8 | 74 | 0.1 | 9.9 | 12.3 | 0.0 |
| Others in this class..... | 28 | 0.5 | 3.8 | 198 | 0.3 | 26.4 | 7.1 | 0.1 |
| TOTAL CLASS VII..... | 62 | 1.1 | 8.3 | 550 | 0.8 | 73.4 | 8.9 | 0.2 |
| CLASS VIII – DISEASES of the RESPIRATORY SYSTEM | | | | | | | | |
| Coryza, rhinitis, naso-pharyngitis, pharyngitis..... | 1,035 | 17.5 | 138.1 | 5,045 | 7.8 | 673.4 | 4.9 | 1.8 |
| Deviated septum..... | 20 | 0.3 | 2.7 | 167 | 0.3 | 22.3 | 8.4 | 0.1 |
| Diseases of accessory sinuses (1)..... | 79 | 1.3 | 10.6 | 742 | 1.1 | 99.0 | 9.4 | 0.3 |
| Bronchitis, acute..... | 73 | 1.2 | 9.7 | 576 | 0.9 | 76.9 | 7.9 | 0.2 |
| Bronchitis, chronic & n.s..... | 49 | 0.8 | 6.5 | 409 | 0.6 | 54.6 | 8.3 | 0.1 |
| Bronchopneumonia..... | 15 | 0.3 | 2.0 | 368 | 0.6 | 49.1 | 24.5 | 0.1 |
| Lobar pneumonia..... | 25 | 0.4 | 3.3 | 449 | 0.7 | 59.9 | 18.0 | 0.2 |
| Pneumonia, unspecified..... | 29 | 0.5 | 3.9 | 726 | 1.1 | 96.9 | 25.0 | 0.3 |
| Pleurisy..... | 14 | 0.2 | 1.9 | 275 | 0.4 | 36.7 | 19.6 | 0.1 |
| Asthma, hay fever..... | 4 | 0.1 | 0.5 | 22 | 0.0 | 2.9 | 5.5 | 0.0 |
| Others in this class..... | 107 | 1.8 | 14.3 | 677 | 1.0 | 90.4 | 6.3 | 0.3 |
| TOTAL CLASS VIII..... | 1,450 | 24.4 | 193.5 | 9,456 | 14.5 | 1262.1 | 6.5 | 3.5 |
| CLASS IX – DISEASES OF THE DIGESTIVE SYSTEM | | | | | | | | |
| Disease of buccal cavity..... | 21 | 0.4 | 2.8 | 105 | 0.2 | 14.0 | 5.0 | 0.0 |
| Disease of tonsils and adenoids..... | 738 | 12.4 | 98.5 | 4,449 | 6.8 | 593.8 | 6.0 | 1.6 |
| Vincent's infection..... | 71 | 1.2 | 9.5 | 469 | 0.7 | 62.6 | 6.6 | 0.2 |
| Peptic ulcer..... | 40 | 0.7 | 5.3 | 1,049 | 1.6 | 140.0 | 26.2 | 0.4 |
| Gastritis, acute & chronic..... | 43 | 0.7 | 5.7 | 238 | 0.4 | 31.8 | 5.5 | 0.1 |
| Other diseases of stomach..... | 6 | 0.1 | 0.8 | 31 | 0.0 | 4.1 | 5.2 | 0.0 |
| Gastroenteritis, colitis..... | 102 | 1.7 | 13.6 | 434 | 0.7 | 57.9 | 4.3 | 0.2 |
| Appendicitis..... | 126 | 2.1 | 16.8 | 1,825 | 2.8 | 243.6 | 14.5 | 0.7 |
| Hernia..... | 35 | 0.6 | 4.7 | 1,201 | 1.9 | 160.3 | 34.3 | 0.4 |
| Dis. of anus & rectum..... | 5 | 0.1 | 0.7 | 59 | 0.1 | 7.9 | 11.8 | 0.0 |
| Diseases of liver..... | 9 | 0.1 | 1.2 | 111 | 0.2 | 14.8 | 12.3 | 0.0 |
| Diseases of gall bladder..... | 6 | 0.1 | 0.8 | 115 | 0.2 | 15.4 | 19.2 | 0.0 |
| Others in this class..... | 54 | 0.9 | 7.2 | 421 | 0.6 | 56.2 | 7.8 | 0.2 |
| TOTAL CLASS IX..... | 1,256 | 21.1 | 167.6 | 10,507 | 16.2 | 1,402.4 | 8.4 | 3.8 |
| CLASS X – DISEASES OF THE GENITO-URINARY SYSTEM | | | | | | | | |
| Dis. of kidney & ureter..... | 21 | 0.4 | 2.8 | 762 | 1.2 | 101.7 | 36.3 | 0.3 |
| Diseases of bladder..... | 22 | 0.4 | 2.9 | 443 | 0.7 | 59.1 | 20.1 | 0.1 |
| Dis. of male genital organs..... | 40 | 0.7 | 5.3 | 469 | 0.7 | 62.6 | 11.7 | 0.2 |
| Dis. of urethra (2)..... | 83 | 1.4 | 11.1 | 1,211 | 1.9 | 161.7 | 14.6 | 0.4 |
| Others in this class..... | 17 | 0.3 | 2.3 | 198 | 0.3 | 26.4 | 11.6 | 0.1 |
| TOTAL CLASS X..... | 183 | 3.2 | 24.4 | 3,083 | 4.8 | 411.5 | 16.8 | 1.1 |
| CLASS XII – DISEASES OF SKIN AND CELLULAR TISSUE | | | | | | | | |
| Boils & carbuncles..... | 133 | 2.1 | 17.8 | 683 | 1.0 | 91.2 | 5.1 | 0.3 |
| Cellulitis..... | 104 | 1.7 | 13.9 | 644 | 1.0 | 86.0 | 6.2 | 0.2 |
| Scabies..... | 31 | 0.5 | 4.1 | 128 | 0.2 | 17.1 | 4.0 | 0.0 |
| Others in this class (3)..... | 109 | 2.0 | 14.5 | 763 | 1.2 | 101.8 | 7.0 | 0.3 |
| TOTAL CLASS XII..... | 377 | 6.3 | 50.3 | 2,218 | 3.4 | 296.1 | 5.9 | 0.8 |

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, e.g. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization, per 1000 strength per year.

(1) Includes barotrauma.

(2) Includes non-specific urethritis. For 1943-44 there were 43 cases and 771 days.

(3) Includes inipetigo. For 1943-44 there were two cases and 18 days.

APPENDIX C-2 (cont'd.)
CHIEF CAUSES OF HOSPITALIZATION
R.A.A.F. PERSONNEL IN CANADA—1941 to 1944

| DIAGNOSIS | CASES† | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|--|--------|-------|-------|---------------|-------|---------|---------------|-------|
| | Number | % | Rate* | Number | % | Rate* | | |
| CLASS XIII – DISEASES of the BONES AND ORGANS OF LOCOMOTION | | | | | | | | |
| Diseases of the bones | 3 | 0.0 | 0.4 | 64 | 0.1 | 8.5 | 21.3 | 0.0 |
| Diseases of the joints | 13 | 0.2 | 1.7 | 401 | 0.6 | 53.5 | 30.8 | 0.2 |
| Dis. of organs of locomotion | 20 | 0.3 | 2.7 | 175 | 0.3 | 23.4 | 8.8 | 0.0 |
| TOTAL CLASS XIII | 36 | 0.6 | 4.8 | 640 | 1.0 | 85.4 | 17.8 | 0.2 |
| CLASS XIV – CONGENITAL MALFORMATIONS (1) | 13 | 0.2 | 1.7 | 375 | 0.6 | 50.1 | 28.8 | 0.1 |
| CLASS XVII – ACCIDENTS, INJURIES AND OTHER EXTERNAL VIOLENCE | | | | | | | | |
| Fractures | 124 | 2.1 | 16.6 | 3,855 | 5.9 | 514.5 | 31.1 | 1.4 |
| Dislocations | 14 | 0.2 | 1.9 | 343 | 0.5 | 45.8 | 24.5 | 0.1 |
| Burns and scalds | 16 | 0.3 | 2.1 | 786 | 1.2 | 104.9 | 49.1 | 0.3 |
| Cuts, lacerations, contusions | 95 | 1.6 | 12.7 | 570 | 0.9 | 76.1 | 6.0 | 0.2 |
| Sprains, strains, joint injury | 90 | 1.5 | 12.0 | 735 | 1.1 | 98.1 | 87.2 | 0.3 |
| Foreign bodies | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Concussion | 21 | 0.3 | 2.8 | 188 | 0.3 | 25.1 | 9.0 | 0.1 |
| Others in this class | 69 | 1.2 | 9.2 | 1,094 | 1.7 | 146.0 | 15.9 | 0.4 |
| TOTAL CLASS XVII | 429 | 7.2 | 57.3 | 7,571 | 11.6 | 1,010.5 | 17.6 | 2.8 |
| CLASS XVIII – ILL-DEFINED CONDITIONS | 83 | 1.4 | 11.1 | 1,080 | 1.7 | 144.2 | 13.0 | 0.4 |
| CLASS XIX – PREVENTATIVE MEDICAL CARE | 65 | 1.1 | 8.7 | 184 | 0.3 | 24.6 | 28.3 | 0.1 |
| GRAND TOTAL | 5,942 | 100.0 | 793.1 | 65,024 | 100.0 | 8,679.1 | 10.9 | 23.6 |

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (is. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (ie. discharges and deaths).

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, e.g. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization, per 1000 strength per year.

(1) Includes pilonidal sinus. For 1943-44 there were 9 cases and 318 days.

APPENDIX A-3

QUARTERLY HOSPITAL MORBIDITY STATISTICS—1941 to 1944
R.N.Z.A.F. PERSONNEL IN CANADA

| YEAR | Quarter | CASES* | | DAYS OF CARE‡ | | Days of Care Per Case | Average No. in Hospital Daily | DNER† |
|------|---------|--------|-------|---------------|--------|-----------------------|-------------------------------|-------|
| | | Number | Rate† | Number | Rate† | | | |
| 1941 | 1st | 243 | 2,055 | 2,198 | 18,592 | 9.0 | 24.4 | 50.9 |
| | 2nd | 352 | 1,487 | 3,112 | 13,150 | 8.8 | 34.2 | 36.0 |
| | 3rd | 278 | 1,050 | 2,226 | 8,408 | 8.0 | 24.2 | 23.0 |
| | 4th | 368 | 1,364 | 3,626 | 13,441 | 9.8 | 39.4 | 36.8 |
| | TOTAL | 1,241 | 1,397 | 11,162 | 12,570 | 9.0 | 30.6 | 34.4 |
| 1942 | 1st | 697 | 2,459 | 6,915 | 24,434 | 9.9 | 76.8 | 66.9 |
| | 2nd | 360 | 1,109 | 5,228 | 16,114 | 14.5 | 57.4 | 44.1 |
| | 3rd | 211 | 599 | 3,352 | 9,519 | 15.9 | 36.4 | 26.1 |
| | 4th | 209 | 543 | 2,385 | 6,225 | 11.5 | 25.9 | 17.0 |
| | TOTAL | 1,477 | 1,102 | 17,880 | 13,343 | 12.1 | 49.0 | 36.6 |
| 1943 | 1st | 428 | 1,023 | 4,012 | 9,587 | 9.4 | 44.6 | 26.3 |
| | 2nd | 403 | 886 | 4,499 | 9,896 | 11.2 | 49.4 | 27.1 |
| | 3rd | 252 | 543 | 3,299 | 7,110 | 13.1 | 35.8 | 19.5 |
| | 4th | 380 | 847 | 3,769 | 8,401 | 9.9 | 41.0 | 23.0 |
| | TOTAL | 1,463 | 819 | 15,579 | 8,723 | 10.6 | 42.7 | 23.7 |
| 1944 | 1st | 339 | 747 | 3,623 | 7,883 | 10.7 | 40.2 | 21.6 |
| | 2nd | 382 | 763 | 6,416 | 12,825 | 16.8 | 70.5 | 35.1 |
| | 3rd | 245 | 574 | 3,618 | 8,479 | 14.8 | 39.3 | 23.2 |
| | 4th | 110 | 322 | 1,924 | 5,633 | 17.4 | 20.9 | 15.4 |
| | TOTAL | 1,076 | 624 | 15,581 | 9,032 | 14.5 | 42.6 | 24.7 |

† All rates are expressed per 1000 strength per year based on mid-month strength statistics prepared by R.C.A.F. Records Office. For example, the Daily Non-Effective Rate is the average number of men who were hospitalized daily during the period per 1000 strength per year.

* Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

APPENDIX B-3

MONTHLY HOSPITAL MORBIDITY STATISTICS—1941 to 1944

R.N.Z.A.F. PERSONNEL IN CANADA

| YEAR | Month | CASES* | | DAYS OF CARE‡ | | Days of Care Per Case | Average No. in Hospital Daily | DNER† |
|------|-------|--------|-------|---------------|--------|-----------------------|-------------------------------|-------|
| | | Number | Rate† | Number | Rate† | | | |
| 1941 | Jan. | 59 | 2,054 | 520 | 18,100 | 8.8 | 16.8 | 49.6 |
| | Feb. | 82 | 2,608 | 778 | 24,744 | 9.5 | 27.8 | 67.7 |
| | Mar. | 102 | 1,744 | 900 | 15,391 | 8.8 | 29.0 | 42.1 |
| | Apr. | 117 | 1,662 | 922 | 13,097 | 7.8 | 30.7 | 35.8 |
| | May | 112 | 1,342 | 967 | 11,584 | 8.6 | 31.2 | 31.7 |
| | Jun. | 123 | 1,487 | 1,223 | 14,783 | 9.9 | 40.8 | 40.5 |
| | Jul. | 58 | 664 | 543 | 6,215 | 9.4 | 17.5 | 17.0 |
| | Aug. | 104 | 1,194 | 698 | 8,012 | 6.7 | 22.5 | 21.9 |
| | Sept. | 116 | 1,290 | 985 | 10,957 | 8.5 | 32.8 | 30.0 |
| | Oct. | 93 | 994 | 1,211 | 12,944 | 13.0 | 38.7 | 35.4 |
| | Nov. | 116 | 1,274 | 1,125 | 12,358 | 9.7 | 36.5 | 33.8 |
| | Dec. | 159 | 1,870 | 1,290 | 15,176 | 8.1 | 41.6 | 41.5 |
| | TOTAL | 1,241 | 1,397 | 11,162 | 12,570 | 9.0 | 30.6 | 34.4 |
| 1942 | Jan. | 282 | 3,227 | 2,433 | 27,846 | 8.6 | 78.4 | 76.3 |
| | Feb. | 212 | 2,197 | 2,159 | 20,869 | 10.1 | 77.1 | 57.2 |
| | Mar. | 203 | 2,069 | 2,323 | 23,671 | 11.4 | 74.9 | 64.8 |
| | Apr. | 413 | 1,349 | 2,106 | 19,867 | 14.7 | 70.2 | 54.4 |
| | May | 128 | 1,289 | 1,809 | 18,213 | 14.1 | 58.3 | 49.9 |
| | Jun. | 89 | 751 | 1,313 | 11,080 | 14.7 | 43.7 | 30.4 |
| | Jul. | 69 | 595 | 1,195 | 10,872 | 17.3 | 38.5 | 29.8 |
| | Aug. | 79 | 736 | 1,212 | 11,270 | 15.3 | 39.0 | 30.9 |
| | Sept. | 63 | 470 | 945 | 7,050 | 15.0 | 31.5 | 19.3 |
| | Oct. | 52 | 388 | 728 | 5,277 | 14.0 | 23.4 | 14.4 |
| | Nov. | 74 | 661 | 772 | 6,897 | 10.4 | 25.7 | 18.9 |
| | Dec. | 83 | 627 | 885 | 6,681 | 10.6 | 28.5 | 18.3 |
| | TOTAL | 1,477 | 1,102 | 17,880 | 13,313 | 12.1 | 49.0 | 36.6 |
| 1943 | Jan. | 100 | 726 | 1,034 | 7,513 | 10.3 | 33.3 | 20.6 |
| | Feb. | 147 | 1,095 | 1,390 | 10,531 | 9.4 | 49.6 | 28.4 |
| | Mar. | 181 | 1,241 | 1,588 | 10,888 | 8.7 | 51.2 | 29.8 |
| | Apr. | 127 | 882 | 1,444 | 9,737 | 11.3 | 48.1 | 26.7 |
| | May | 164 | 1,088 | 1,699 | 11,276 | 10.3 | 54.2 | 30.9 |
| | Jun. | 112 | 702 | 1,356 | 8,499 | 12.1 | 45.2 | 23.3 |
| | Jul. | 109 | 698 | 1,360 | 8,614 | 12.4 | 44.3 | 23.6 |
| | Aug. | 61 | 375 | 1,058 | 6,512 | 17.3 | 34.1 | 17.8 |
| | Sept. | 82 | 571 | 881 | 6,136 | 10.7 | 29.3 | 16.8 |
| | Oct. | 74 | 482 | 1,048 | 6,828 | 14.1 | 33.5 | 18.7 |
| | Nov. | 150 | 1,037 | 1,362 | 9,421 | 9.0 | 45.4 | 25.8 |
| | Dec. | 156 | 1,038 | 1,359 | 9,045 | 8.7 | 43.8 | 24.8 |
| | TOTAL | 1,463 | 819 | 15,579 | 8,723 | 10.6 | 42.7 | 23.9 |
| 1944 | Jan. | 110 | 757 | 995 | 6,850 | 9.0 | 32.0 | 18.7 |
| | Feb. | 105 | 761 | 1,184 | 8,587 | 11.2 | 40.8 | 23.5 |
| | Mar. | 124 | 725 | 1,444 | 8,443 | 11.6 | 46.5 | 23.1 |
| | Apr. | 119 | 705 | 1,937 | 11,473 | 16.2 | 64.5 | 31.3 |
| | May | 160 | 944 | 1,910 | 11,275 | 11.9 | 61.6 | 30.8 |
| | Jun. | 103 | 637 | 2,569 | 15,881 | 24.9 | 85.6 | 43.4 |
| | Jul. | 88 | 562 | 1,281 | 8,178 | 14.5 | 41.3 | 22.3 |
| | Aug. | 95 | 615 | 1,151 | 7,450 | 12.1 | 37.4 | 20.4 |
| | Sept. | 62 | 534 | 1,186 | 10,214 | 19.1 | 39.5 | 27.9 |
| | Oct. | 49 | 442 | 804 | 7,275 | 16.4 | 25.9 | 20.1 |
| | Nov. | 33 | 296 | 535 | 4,797 | 16.2 | 17.8 | 13.1 |
| | Dec. | 28 | 235 | 585 | 4,721 | 20.8 | 18.8 | 13.4 |
| | TOTAL | 1,076 | 624 | 15,581 | 9,032 | 14.5 | 42.6 | 24.7 |

† All rates are expressed per 1000 strength per year based on mid-month strength statistics prepared by R.C.A.F. Records Office. For example, the Daily Non-Effective Rate is the average number of men who were hospitalized daily during the period per 1000 strength per year.

* Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

APPENDIX C-3

CHIEF CAUSES OF HOSPITALIZATION

| DIAGNOSIS | CASES† | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|---|--------|------|-------|---------------|------|---------|---------------|-------|
| | Number | % | Rate* | Number | % | Rate* | | |
| CLASS I – INFECTIVE AND PARASITIC DISEASES | | | | | | | | |
| Measles..... | 101 | 1.9 | 17.6 | 1,142 | 1.9 | 199.1 | 11.3 | 0.6 |
| Scarlet fever..... | 102 | 1.9 | 17.7 | 2,862 | 4.8 | 499.0 | 14.2 | 1.4 |
| Diphtheria..... | 4 | 0.1 | 0.7 | 96 | 0.1 | 16.7 | 24.0 | 0.0 |
| Influenza..... | 170 | 10.9 | 99.4 | 3,695 | 6.1 | 644.2 | 6.5 | 1.8 |
| Meningococcal meningitis..... | 1 | 0.0 | 0.2 | 24 | 0.0 | 4.2 | 24.0 | 0.0 |
| Tuberculosis, respiratory..... | 12 | 0.2 | 2.1 | 2,338 | 3.9 | 407.6 | 19.5 | 1.1 |
| Tuberculosis, other forms..... | 2 | 0.0 | 0.3 | 77 | 0.1 | 13.4 | 38.5 | 0.0 |
| Syphilis (1)..... | 9 | 0.2 | 1.6 | 166 | 0.3 | 28.9 | 18.4 | 1.1 |
| Gonorrhoea..... | 96 | 1.8 | 16.7 | 2,032 | 3.4 | 354.2 | 29.5 | 1.0 |
| Chickenpox..... | 75 | 1.4 | 13.1 | 1,151 | 2.0 | 200.7 | 15.3 | 0.6 |
| German measles..... | 48 | 0.9 | 8.4 | 275 | 0.4 | 47.9 | 5.7 | 0.1 |
| Mumps..... | 402 | 7.7 | 70.2 | 6,182 | 10.3 | 1,077.8 | 15.4 | 3.0 |
| Fungus infections (2)..... | 11 | 0.2 | 1.9 | 103 | 0.2 | 18.0 | 11.4 | 0.0 |
| Others in this class..... | 14 | 0.3 | 2.4 | 289 | 0.5 | 50.4 | 20.6 | 0.1 |
| TOTAL CLASS I..... | 1,447 | 27.5 | 252.3 | 20,432 | 34.0 | 3562.1 | 14.1 | 9.8 |
| CLASS II – NEOPLASMS | | | | | | | | |
| Malignant neoplasms..... | 3 | 0.1 | 0.5 | 75 | 0.1 | 13.1 | 25.0 | 0.0 |
| Other neoplasms..... | 6 | 0.1 | 1.1 | 63 | 0.1 | 11.0 | 10.5 | 0.0 |
| TOTAL CLASS II..... | 9 | 0.2 | 1.6 | 138 | 0.2 | 24.1 | 15.3 | 0.1 |
| CLASS III – RHEUMATIC DISEASES DISEASES OF NUTRITION ENDOCRINE GLANDS AND OTHER GENERAL DISEASES | | | | | | | | |
| Rheumatic fever..... | 60 | 1.1 | 10.5 | 5,708 | 9.5 | 995.1 | 95.1 | 2.7 |
| Rheumatoid arthritis..... | 3 | 0.1 | 0.5 | 144 | 0.2 | 25.1 | 48.0 | 0.1 |
| Other arthritic conditions..... | 15 | 0.3 | 2.6 | 184 | 0.3 | 32.1 | 12.3 | 0.1 |
| Fibrositis, myalgia lumbago, sciatica..... | 6 | 0.1 | 1.0 | 103 | 0.2 | 17.4 | 6.7 | 0.0 |
| Others in this class..... | 6 | 0.1 | 1.0 | 103 | 0.2 | 18.0 | 17.0 | 0.0 |
| TOTAL CLASS III..... | 99 | 1.9 | 17.2 | 6,239 | 10.4 | 1,087.7 | 63.0 | 3.0 |
| CLASS IV – DISEASES OF BLOOD AND BLOOD-FORMING ORGANS..... | | | | | | | | |
| | 1 | 0.0 | 0.2 | 109 | 0.2 | 19.0 | 10.9 | 0.0 |
| CLASS V – CHRONIC POISONING AND INTOXICATION..... | | | | | | | | |
| | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| CLASS VI – DISEASES OF THE NERVOUS SYSTEM | | | | | | | | |
| Psychoneuroses..... | 27 | 0.5 | 4.7 | 350 | 0.6 | 61.0 | 13.0 | 0.2 |
| Psychoses..... | 9 | 0.2 | 1.6 | 2,446 | 0.4 | 42.9 | 27.0 | 0.1 |
| Other psychiatric disorders..... | 1 | 0.0 | 0.2 | 16 | 0.0 | 2.8 | 16.0 | 0.0 |
| Epilepsy..... | 3 | 0.1 | 0.5 | 48 | 0.1 | 8.4 | 16.0 | 0.0 |
| Other dis. of nervous system..... | 10 | 0.2 | 1.7 | 214 | 0.3 | 37.3 | 21.4 | 0.1 |
| Conjunctiva..... | 24 | 0.5 | 4.2 | 197 | 0.3 | 34.3 | 8.2 | 0.1 |
| Other dis. of organs of vision..... | 18 | 0.3 | 3.1 | 352 | 0.6 | 61.4 | 20.1 | 0.2 |
| Otitis media..... | 160 | 3.1 | 27.9 | 1,738 | 2.9 | 303.0 | 10.9 | 0.8 |
| Other ear conditions..... | 17 | 0.3 | 3.0 | 129 | 0.2 | 22.5 | 7.6 | 0.1 |
| NYD, other than mental..... | 2 | 0.0 | 0.3 | 41 | 0.1 | 7.1 | 20.5 | 0.0 |
| TOTAL CLASS VI..... | 271 | 5.2 | 47.2 | 3,331 | 5.5 | 580.7 | 12.3 | 1.6 |

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, e.g. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization, per 1000 strength per year.

(1) Includes neurosyphilis and cardiovascular syphilis.

(2) Includes ringworm, athlete's foot.

(3) Includes leukaemia and Hodgkin's disease.

APPENDIX C-3 (cont'd.)

CHIEF CAUSES OF HOSPITALIZATION
R.N.Z.A.F. PERSONNEL IN CANADA—1941 to 1944

| DIAGNOSIS | CASES† | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|---|--------------|-------------|--------------|---------------|-------------|----------------|---------------|------------|
| | Number | % | Rate* | Number | % | Rate* | | |
| CLASS VII – DISEASES OF THE CIRCULATORY SYSTEM | | | | | | | | |
| Diseases of the heart | 2 | 0.0 | 0.5 | 89 | 0.1 | 15.5 | 44.5 | 0.0 |
| Haemorrhoids..... | 20 | 0.4 | 3.5 | 176 | 0.3 | 30.7 | 8.8 | 0.1 |
| Varicose veins..... | 8 | 0.2 | 1.3 | 101 | 0.2 | 17.6 | 12.6 | 0.0 |
| Other dis. of arteries and veins | 6 | 0.1 | 1.0 | 56 | 0.1 | 9.8 | 9.3 | 0.0 |
| Others in this class | 46 | 0.9 | 8.0 | 481 | 0.8 | 83.8 | 10.5 | 0.2 |
| TOTAL CLASS VII | 82 | 1.6 | 14.3 | 903 | 1.5 | 157.4 | 11.0 | 0.4 |
| CLASS VIII – DISEASES OF THE RESPIRATORY SYSTEM | | | | | | | | |
| Coryza, rhinitis, naso-pharyngitis, | | | | | | | | |
| pharyngitis..... | 916 | 17.4 | 159.7 | 4,495 | 7.5 | 783.6 | 4.9 | 2.2 |
| Deviated septum..... | 17 | 0.3 | 3.0 | 149 | 0.3 | 26.0 | 8.8 | 0.1 |
| Diseases of accessory sinuses (1) | 65 | 1.2 | 11.3 | 727 | 1.2 | 126.7 | 11.2 | 0.4 |
| Bronchitis, acute | 57 | 1.1 | 10.0 | 490 | 0.8 | 85.4 | 8.6 | 0.2 |
| Bronchitis, chronic & n.s. | 40 | 0.8 | 7.0 | 503 | 0.8 | 87.8 | 12.6 | 0.2 |
| Bronchopneumonia | 14 | 0.3 | 2.4 | 304 | 0.5 | 53.0 | 21.7 | 0.1 |
| Lobar pneumonia | 29 | 0.5 | 5.0 | 700 | 1.2 | 122.0 | 24.1 | 0.3 |
| Pneumonia, unspecified | 38 | 0.7 | 6.6 | 809 | 0.3 | 141.0 | 21.3 | 0.4 |
| Pleurisy | 25 | 0.5 | 4.4 | 795 | 0.3 | 138.6 | 31.8 | 0.4 |
| Asthma, hay fever | 3 | 0.1 | 0.5 | 56 | 0.1 | 9.8 | 18.6 | 0.0 |
| Others in this class | 75 | 1.4 | 13.1 | 749 | 1.2 | 130.6 | 10.0 | 0.4 |
| TOTAL CLASS VIII | 1,279 | 24.3 | 223.0 | 9,777 | 16.2 | 1,704.5 | 7.6 | 4.7 |
| CLASS IX – DISEASES OF THE DIGESTIVE SYSTEM | | | | | | | | |
| Disease of buccal cavity..... | 26 | 0.5 | 4.5 | 200 | 0.3 | 34.9 | 7.7 | 0.1 |
| Disease of tonsils and adenoids | 681 | 12.9 | 118.7 | 4391 | 7.4 | 765.5 | 6.4 | 2.1 |
| Vincent's infection..... | 29 | 0.6 | 5.1 | 178 | 0.3 | 31.0 | 6.1 | 0.1 |
| Peptic ulcer..... | 15 | 0.3 | 2.6 | 379 | 0.6 | 66.1 | 25.3 | 0.2 |
| Gastritis, acute and chronic | 27 | 0.5 | 4.7 | 123 | 0.2 | 21.4 | 4.6 | 0.0 |
| Other dis. of stomach..... | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gastroenteritis, colitis | 93 | 1.8 | 16.2 | 401 | 0.7 | 70.0 | 4.3 | 0.2 |
| Appendicitis | 89 | 1.7 | 15.5 | 1,165 | 1.9 | 203.1 | 13.0 | 0.5 |
| Hernia..... | 19 | 0.4 | 3.3 | 545 | 0.9 | 95.0 | 28.7 | 0.2 |
| Dis. of anus & rectum | 10 | 0.2 | 1.8 | 410 | 0.7 | 71.5 | 41.0 | 0.2 |
| Diseases of liver | 2 | 0.0 | 0.3 | 46 | 0.1 | 8.0 | 23.0 | 0.0 |
| Diseases of gall bladder | 1 | 0.0 | 0.2 | 10 | 0.0 | 1.7 | 10.0 | 0.0 |
| Others in this class | 48 | 0.9 | 8.4 | 434 | 0.7 | 75.7 | 9.0 | 0.2 |
| TOTAL CLASS IX | 1,040 | 19.8 | 181.3 | 8,282 | 13.8 | 1,443.9 | 8.0 | 3.9 |
| CLASS X – DISEASES OF THE GENITO-URINARY SYSTEM | | | | | | | | |
| Dis. of kidney & ureter | 15 | 0.3 | 2.6 | 193 | 0.3 | 33.7 | 12.9 | 0.1 |
| Diseases of bladder | 15 | 0.3 | 2.6 | 240 | 0.4 | 41.8 | 16.0 | 0.1 |
| Dis. of male genital organs | 39 | 0.7 | 6.8 | 498 | 0.8 | 86.8 | 12.8 | 0.2 |
| Dis. of urethra (2)..... | 37 | 0.7 | 6.5 | 412 | 0.7 | 71.8 | 11.1 | 0.2 |
| Others in this class | 12 | 0.2 | 2.1 | 144 | 0.3 | 25.1 | 12.0 | 0.1 |
| TOTAL CLASS X | 118 | 2.2 | 20.6 | 1,487 | 2.5 | 259.2 | 12.6 | 0.7 |
| CLASS XII – DISEASES OF THE SKIN AND CELLULAR TISSUE | | | | | | | | |
| Boils & carbuncles..... | 123 | 2.3 | 21.4 | 740 | 1.2 | 129.0 | 6.0 | 0.3 |
| Cellulitis | 101 | 1.9 | 17.6 | 644 | 1.2 | 112.3 | 6.4 | 0.3 |
| Scabies | 23 | 0.4 | 4.0 | 146 | 0.3 | 25.5 | 6.3 | 0.1 |
| Others in this class (3)..... | 91 | 1.7 | 15.9 | 614 | 1.0 | 107.0 | 6.7 | 0.3 |
| TOTAL CLASS XII | 338 | 6.3 | 58.9 | 2,144 | 3.6 | 373.8 | 6.3 | 1.0 |

† Cases for 1941 to 1943 inclusive are new admissions (transfers and re-admissions excluded); for 1944 they are all completed case (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

* rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, eg. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization, per 1000 strength per year.

(1) Includes barotrauma.

(2) Includes non-specific urethritis. For 1943-44 there were 20 cases and 246 days.

(3) Includes impetigo. For 1943-44 there were 2 cases and 13 days.

APPENDIX C-3 (cont'd.)
CHIEF CAUSES OF HOSPITALIZATION
R.N.Z.A.F. PERSONNEL IN CANADA—1941 to 1944

| DIAGNOSIS | CASES† | | | DAYS OF CARE‡ | | | Days Per Case | DNER* |
|---|--------|-------|-------|---------------|-------|----------|---------------|-------|
| | Number | % | Rate* | Number | % | Rate* | | |
| CLASS XIII – DISEASES OF THE BONES AND ORGANS OF LOCOMOTION | | | | | | | | |
| Diseases of the bones | 6 | 0.1 | 1.1 | 305 | 0.5 | 53.2 | 56.3 | 0.1 |
| Diseases of the joints | 23 | 0.4 | 4.0 | 289 | 0.5 | 50.4 | 12.6 | 0.1 |
| Dis. of organs of locomotion | 30 | 0.6 | 5.2 | 354 | 0.6 | 61.7 | 11.8 | 0.2 |
| TOTAL CLASS XIII | 59 | 1.1 | 10.3 | 948 | 1.6 | 165.3 | 16.1 | 0.4 |
| CLASS XIV – CONGENITAL MALFORMATIONS | 3 | 0.1 | 0.5 | 67 | 0.1 | 11.7 | 22.3 | 0.0 |
| CLASS XVII – ACCIDENTS, INJURIES, AND OTHER EXTERNAL VIOLENCE | | | | | | | | |
| Fractures | 83 | 1.6 | 14.5 | 2,631 | 4.4 | 458.8 | 31.8 | 1.2 |
| Dislocations | 11 | 0.2 | 1.9 | 151 | 0.3 | 26.3 | 13.7 | 0.1 |
| Burns and scalds | 3 | 0.1 | 0.5 | 22 | 0.0 | 3.8 | 7.3 | 0.0 |
| Cuts, lacerations, contusions | 91 | 1.7 | 15.9 | 553 | 0.9 | 96.4 | 6.1 | 0.3 |
| Sprains, strains, joint injury | 75 | 1.4 | 13.1 | 615 | 1.0 | 107.2 | 8.2 | 0.3 |
| Foreign bodies | 1 | 0.0 | 0.2 | 4 | 0.0 | 0.7 | 4.0 | 0.0 |
| Concussion | 14 | 0.3 | 2.4 | 263 | 0.4 | 45.9 | 18.8 | 0.1 |
| Others in this class | 103 | 2.0 | 17.9 | 1,479 | 2.5 | 257.8 | 14.4 | 0.7 |
| TOTAL CLASS XVII | 381 | 7.3 | 66.4 | 5,718 | 9.5 | 996.9 | 15.0 | 2.7 |
| CLASS XVIII – ILL-DEFINED CONDITIONS | 69 | 1.3 | 12.1 | 457 | 0.8 | 79.7 | 6.6 | 0.2 |
| CLASS XIX – PREVENTIVE MEDICAL CARE | 61 | 1.2 | 10.6 | 170 | 0.3 | 29.6 | 2.8 | 0.1 |
| GRAND TOTAL | 5,257 | 100.0 | 916.5 | 60,202 | 100.0 | 10,495.5 | 11.5 | 28.7 |

† Cases for 1941 to 1943 inclusive are new admissions (transfers and readmissions excluded); for 1944 they are all completed cases (i.e. discharges and deaths).

‡ Days of care for 1941 to 1943 are the total days for all patients treated during the period; for 1944 they are the hospital days for completed cases (i.e. discharges and deaths).

* All rates are expressed per 1000 strength per year based on R.C.A.F. Records Office wartime strength tabulations, e.g. the D.N.E.R. is the average daily number of men who were non-effective due to hospitalization, per 1000 strength per year.

PART C-COMMUNICABLE DISEASE STATISTICS

The purpose of this section is to present some of the essential statistics on the incidence of the common acute communicable diseases among R.A.F., R.A.A.F., and R.N.Z.A.F. personnel in Canada during the war. These statistics are of special interest to the military medical services in considering past, current, and future measures for control.

The figures presented relate to the five common infectious diseases — chickenpox, German measles, measles, mumps, and scarlet fever. Some reference is made to other communicable diseases of lesser frequency, further details on which are to be found in the detailed statistical tables in Part B - Hospital Morbidity Statistics.

Source of Data

The statistics presented were derived from the machine tabulations of hospital morbidity data made from information recorded on the monthly

returns of patients treated in hospital (Form M32). The figures relate to new admissions for the years 1941 to 1943 inclusive, and to completed cases (discharges and deaths) for the calendar year 1944. It is emphasized that these statistics represent diagnosed cases; in the first three years there may be some modest over-estimate of incidence.

Highlights

The numbers of recorded cases and the case rates per thousand strength per annum for the five principal acute communicable diseases — chickenpox, German measles, measles, mumps, and scarlet fever — among R.A.F., R.A.A.F., and R.N.Z.A.F. personnel, respectively, are presented in Table I.

TABLE I
INCIDENCE OF THE FIVE PRINCIPAL COMMUNICABLE DISEASES
B.C.A.T.P. PERSONNEL IN CANADA—1941 to 1944

| DISEASE | R.A.F. | | | | R.A.A.F. | | | | R.N.Z.A.F. | | | |
|---|--------|------|-------|------|----------|------|------|------|------------|-------|------|------|
| | 1941 | 1942 | 1943 | 1944 | 1941 | 1942 | 1943 | 1944 | 1941 | 1942 | 1943 | 1944 |
| Numbers of Recorded Cases | | | | | | | | | | | | |
| Chickenpox..... | 21 | 56 | 120 | 152 | 17 | 2 | 41 | 24 | 14 | 13 | 18 | 30 |
| German measles | | | | | | | | | | | | |
| Measles..... | 59 | 150 | 154 | 175 | 27 | 13 | 11 | 11 | 14 | 15 | 8 | 11 |
| Mumps..... | 25 | 98 | 123 | 68 | 36 | 27 | 10 | 8 | 35 | 33 | 17 | 16 |
| Scarlet fever..... | 20 | 207 | 191 | 130 | 104 | 44 | 96 | 91 | 182 | 73 | 76 | 71 |
| | 45 | 355 | 812 | 345 | 16 | 21 | 54 | 33 | 12 | 29 | 24 | 37 |
| TOTAL | 170 | 866 | 1,400 | 870 | 200 | 107 | 212 | 167 | 257 | 163 | 143 | 165 |
| Per Cent of All Cases | 2.7 | 5.7 | 7.0 | 7.6 | 15.3 | 10.3 | 10.2 | 11.0 | 20.7 | 11.0 | 9.8 | 15.3 |
| Rates per 1000 Mean Strength Per Annum* | | | | | | | | | | | | |
| Chickenpox..... | 1.9 | 2.0 | 3.4 | 6.6 | 15.5 | 1.6 | 14.6 | 10.3 | 15.8 | 9.7 | 10.2 | 17.4 |
| German measles | | | | | | | | | | | | |
| Measles..... | 5.5 | 5.5 | 4.3 | 7.5 | 24.6 | 10.6 | 3.9 | 4.7 | 15.8 | 11.2 | 4.4 | 6.3 |
| Mumps..... | 2.3 | 3.6 | 3.5 | 2.9 | 32.8 | 21.9 | 3.6 | 3.4 | 39.4 | 24.6 | 9.5 | 9.3 |
| Scarlet fever..... | 1.8 | 7.6 | 5.4 | 5.6 | 94.7 | 35.7 | 34.2 | 39.0 | 204.9 | 50.5 | 42.6 | 41.2 |
| | 4.2 | 12.9 | 22.9 | 14.8 | 14.6 | 17.1 | 19.2 | 14.1 | 13.5 | 21.6 | 13.4 | 21.4 |
| TOTAL | 15.7 | 31.6 | 39.5 | 37.4 | 182.2 | 86.9 | 75.5 | 71.5 | 289.4 | 117.6 | 80.1 | 95.6 |
| Per Cent of All Days | 3.5 | 8.6 | 11.5 | 9.1 | 21.7 | 14.0 | 18.3 | 14.1 | 32.6 | 15.3 | 14.3 | 19.3 |
| DNER† | 0.7 | 1.7 | 2.4 | 1.9 | 6.3 | 3.6 | 3.9 | 3.2 | 11.2 | 5.6 | 3.4 | 4.8 |
| Daily Number Non-Effective | 7.1 | 47.2 | 85.4 | 45.0 | 6.8 | 4.4 | 11.1 | 7.4 | 10.0 | 7.5 | 6.1 | 8.2 |

* Rate per 1000 mean strength per annum, based on R.C.A.F. Records Office wartime tabulations for personnel in Canada.

† Average number non-effective daily, per 1000 strength per annum.

Source: Tabulations from hospital returns on Forms M32; figures relate to new admissions for 1941 to 1943 and to completed cases (i.e. discharges and deaths) for 1944.

During the four-year period 1941 to 1944 inclusive, 4720 cases of the five specified diseases with 90,038 days of hospital care were recorded among R.A.F., R.A.A.F., and R.N.Z.A.F. personnel in Canada. This is equivalent to 7.4 per cent of all new hospital admissions and 10.6 per cent of all days of hospital care for all causes. Among R.A.F. personnel these diseases contributed 6.2 per cent of all cases and 9.3 per cent of all hospital days; for R.A.A.F. personnel, 11.5 per cent of all cases and 16.9 per cent of all days; for R.N.Z.A.F. personnel, 13.8 per cent of all cases and 19.4 per cent for all days.

Comparative Incidence

There were some quite sharp differences between the three services in the *absolute* incidence of the five principal acute communicable diseases. For the group as a whole, the attack rates were very substantially higher among R.A.A.F. and R.N.Z.A.F. personnel than among R.A.F. personnel. The scarlet fever attack rates for the period differed very little (I 6.1, 16.6 and 17.7, respectively, per 1000 mean strength). For the other four diseases, however, the attack rates were each considerably greater for R.A.A.F. and R.N.Z.A.F. personnel, the excess being very sharp in the case of mumps, especially in 1941.

The *relative* incidence of these diseases among R.A.A.F. and R.N.Z.A.F. personnel, as for R.C.A.F. personnel, was greatest for mumps. For R.A.F. personnel scarlet fever very much outranked the others during the period, especially in 1943.

Further comparison with R.C.A.F. experience may be had by reference to Volume II, Chapter 35, Part B and Part H, both text and tables.

Other Communicable Diseases

Data on other communicable diseases of clinical interest, such as cerebrospinal meningitis, typhoid fever, diphtheria, poliomyelitis, rheumatic fever, tetanus, and smallpox, are not included in Table I but reference to Appendix C in Part B - Hospital Morbidity Statistics is suggested. During the four years 1941 to 1944, inclusive, there were 16 cases of cerebrospinal fever admitted to hospital and of these two died; there were no epidemics. There were two recorded cases of typhoid fever among R.A.F. personnel, but neither was fatal; there were no cases among R.A.A.F. or R.N.Z.A.F. personnel. There were 23 recorded cases of acute anterior poliomyelitis and no deaths. There were 15 recorded admissions for diphtheria, and no deaths. Diagnosed cases of rheumatic fever numbered 466.

There was not a single case of smallpox or tetanus among B.C.A.T.P. personnel in Canada during the war.

PART D-VENEREAL DISEASE STATISTICS

The numbers of recorded cases of venereal disease among R.A.F., R.A.A.F., and R.N.Z.A.F. personnel in Canada and the attack rates per thousand mean strength per annum are presented in Table I. The figures for R.C.A.F. personnel and for all male air force personnel in Canada are included in the table for comparison. These statistics were secured from monthly returns on venereal disease cases made by all units and formations in Canada, separately by service.

TABLE 1
INCIDENCE OF VENEREAL DISEASE
B.C.A.T.P. PERSONNEL IN CANADA--1942 to 1944

| YEAR | R.C.A.F. | | R.A.F. | | R.A.A.F. | | R.N.Z.A.F. | | All Male | |
|-----------|-----------------------------------|--------|--------|--------|----------|--------|------------|--------|----------|--------|
| | V.D.S. | V.D.G. | V.D.S. | V.D.G. | V.D.S. | V.D.G. | V.D.S. | V.D.G. | V.D.S. | V.D.G. |
| | Numbers of Reported Cases | | | | | | | | | |
| 1942 | 415 | 2,146 | 58 | 540 | 3 | 30 | 8 | 25 | 484 | 2,741 |
| 1943 | 240 | 2,177 | 50 | 560 | 4 | 53 | 0 | 23 | 294 | 2,813 |
| 1944 | 146 | 299 | 35 | 339 | 5 | 46 | 3 | 18 | 189 | 2,702 |
| 1942-1944 | 801 | 6622 | 143 | 1,439 | 12 | 129 | 11 | 66 | 967 | 8,256 |
| | Rate per 1000 Strength per Annum* | | | | | | | | | |
| 1942 | 4.1 | 21.2 | 2.1 | 19.7 | (2.4) | 24.4 | 6.0 | 19.7 | 3.7 | 20.9 |
| 1943 | 1.8 | 16.2 | 1.4 | 15.7 | (1.4) | 18.9 | - | 12.9 | 1.7 | 16.1 |
| 1944 | 1.1 | 17.4 | 1.5 | 14.5 | 2.1 | 19.5 | (1.7) | 10.4 | 1.2 | 17.0 |
| 1942-1944 | 2.2 | 18.0 | 1.6 | 16.7 | 1.9 | 20.2 | 2.3 | 13.6 | 2.0 | 17.4 |

* Rates based on R.C.A.F. Records Office wartime strength tabulations.

() Rates based on fewer than five cases.

Source: Monthly returns of venereal disease cases from all units and formations in Canada.

From 1942, there was a substantial drop in the recorded incidence of V.D.G. and V.D.S. among R.A.F., R.A.A.F., and R.N.Z.A.F. personnel and also among all male air force personnel in Canada. This improvement was more particularly striking in the case of syphilis. The available figures (for 1943 and 1944) reflect an increase in the reporting of "non-specific urethritis (ven.)".

PART E-ROUTINE CHEST X-RAY STATISTICS

Throughout the war it was a requirement that a routine 14 x 17 chest x-ray film should be taken on all R.A.F. personnel as soon as possible after arrival in Canada for duty or training. The chest x-ray findings on R.A.F. personnel reported to R.C.A.F. Headquarters during the period 1941 to 1944, inclusive, are presented in Table I.

TABLE I
ROUTINE CHEST X-RAYS—POSITIVE FINDINGS REPORTED
R.A.F. PERSONNEL—1941 to 1944

| YEAR | PERSONS X-RAYED | Tuberculosis | Other Diseases | | Other Chest Disease | TOTAL |
|--|-----------------|--------------------------------|-----------------|----------------|---------------------|-------|
| | | Lungs or Pleura | Lungs or Pleura | Heart or Aorta | | |
| Number with Positive Findings Reported | | | | | | |
| 1941 | 9,104 | 57 | 19 | 16 | 11 | 103 |
| 1942 | 14,375 | 131 | 55 | 15 | 59 | 260 |
| 1943 | 6,475 | 76 | 48 | 1 | 41 | 166 |
| 1944 | 2,824 | 35 | 15 | — | 5 | 55 |
| TOTAL | 32,778 | 299 | 137 | 32 | 116 | 584 |
| YEAR | PERSONS | Rate per 1000 Persons Examined | | | | |
| 1941 | 9,104 | 6.27 | 2.08 | 1.76 | 1.21 | 11.32 |
| 1942 | 14,375 | 9.12 | 3.82 | 1.04 | 4.10 | 18.08 |
| 1943 | 6,475 | 11.72 | 7.39 | (1) | 6.31 | 25.57 |
| 1944 | 2,824 | 12.39 | 5.31 | — | 1.77 | 19.47 |
| TOTAL | 32,778 | 9.13 | 4.27 | 1.01 | 3.54 | 17.95 |

() Indicates actual numbers-rates not computed for fewer than 5 cases.
 Source: Monthly (later quarterly) returns on MF'sM 59 and Forms M19.

Positive chest x-ray findings were reported in 1.8 per cent of all R.A.F. personnel routinely examined. Tuberculosis of lungs or pleura was reported in 0.9 per cent. Both of these figures are somewhat higher than those prevailing over the same period among R.C.A.F. candidates for enlistment (Volume II, Chapter 35, Part I).

TITLES OF FORMS
R.A.F.

| FORM | TITLE |
|------|---|
| 38 | Weekly Sick Return |
| 39 | Hospital or Sick List Record |
| 41 | Case Sheet, Station or Hospital Record, and rough manuscript for completing Form 39 |
| 42 | Special Medical Examination Record |
| 43 | Manuscript notes for completing Form 42 |
| 46 | Medical Board on an Officer, Cadet, Member of the Nursing Service, Airman Pilot, Air Gunner or Air Observer |
| 47 | Manuscript notes for completing Form 46 |
| 48 | Medical History Envelope |
| 64 | Airman's Service and Pay Book |

| | |
|------------|--|
| 241 | Weekly Summary of Sickness in Commands. Air Ministry Health Summary |
| 478 | Venereal Disease Case Card |
| 496 | Application for, and Proceedings of, a Medical Board on an Airman |
| 496A | Medical Board on an Airman suffering from Tuberculosis — Special Report |
| 497 | Medical Board on an Officer — Statement concerning own case by an Officer or Member of the Nursing Service |
| 657 | Medical Board Summary |
| 826 | Medical Board on Entry of Cadets, Officers and Members of the Nursing Service and Airmen Pilots on Selection |
| 827 | Manuscript Notes for completing Form 826 |
| 833 | Report on a Case of Mental Disability |
| 847A | Proceedings of a Medical Board on an Officer or Nurse found to be medically unfit for further Service or in Receipt of Disability Retired Pay |

R.C.A.F.

| FORM | TITLE |
|------------|--|
| M 17 | Monthly Return of Admissions, Discharges, Transfers, Deaths, and Hospital Days |
| M 19 | Monthly Return of X-rays of Chest |
| M23 | Immunization Record Card |
| M21 | Weekly Return of Infectious Diseases - New Cases |
| M32 | Monthly Return of Patients Treated in Hospital or Sick Quarters |
| M33 | Case History Sheet |
| M34 | Treatment Record |
| M35 | Operation Record |
| M50 | Sick Parade Record Card |
| M53 | Case History Sheet (Summary) |
| M56 | Weekly Return of Sick - Sick Parade, New Admissions, Medical Non-Effectiveness, and Beds Occupied |

MISCELLANEOUS

| FORM | TITLE |
|------------------|---|
| P. & H. 100..... | Case History Sheet (D.P. & N.H. Hospitals) |
| MFB 313A..... | Case History Sheet (Canadian Army Hospitals) |
| MFM 59..... | Monthly Return of X-rays of Chest (later R.C.A.F. M 19) |

- PM 38Medical Envelope (Australia)
MPB 204.....Ministry of Pensions, Supplement to be Attached to the invaliding
 Medical Report form in every case with Service in the present war
MPMSD 299.....Ministry of Pensions, Treatment Requirements on
 Invaliding from the Service.

SPECIAL FUNCTIONS OF THE R.C.A.F. MEDICAL BRANCH

MEDICAL MANPOWER

The medical branch was staffed by personnel trained in the various fields of medicine, and in associated sciences and trades, all of whom contributed to its successful development. In addition to the medical officers, there were other groups which either formed part of the branch or worked in close association with it and which were necessary to its efficient functioning. Among these were the medical associates, the members of the nursing service, medical administrative officers, and a great number of other rank ancillary medical personnel, both male and female, in a dozen trades.

Medical Officers

The medical officers formed the principal element of the branch. On them fell the chief responsibility for the care and treatment of all Canadian air force personnel in Canada, a good number overseas, and of thousands of Commonwealth airmen training under the B.C.A.T.P.

Some 811 medical officers, including 14 women, served in the R.C.A.F. during the Second World War. By 1 July 1941, when the medical branch had been operating for some seven months, the medical officer strength was 258, of whom 202 had transferred from the R.C.A.M.C. By the end of the same year the number of medical officers had risen to 386. Peak strength was reached in January 1944 when there were 722 medical officers serving in the R.C.A.F. The number remained almost constant until the end of September of that year, after which it dropped gradually until the end of the war. The number serving overseas was never large principally because of the medical branch's commitments in Canada under the B.C.A.T.P. In February 1943, for example, only 71 R.C.A.F. medical officers were overseas, roughly 11 per cent of the number then in the service. The number subsequently rose, in June 1944, to a peak of 132, or 18.3 per cent of the medical officer strength at the time.

The ratio of medical officers to personnel varied little throughout the war. It remained lower than that for either the Navy or the Army. The ratio in March 1943 was 3.66 per 1000. Every effort was made to conserve manpower in view of the scarcity of trained medical men.

To qualify for appointment to a commission as a medical officer of the R.C.A.F. candidates were required to be (a) "of pure European descent and a British subject, the son of parents both of whom are, or if deceased were at the time of their deaths, British subjects; (b) certified by an authorized medical board as physically fit for service according to physical standards

which may from time to time be laid down; (c) under 45 years of age; (d) a licentiate of the Medical Council of Canada or a registered practitioner in one of the provinces". Candidates were generally appointed to the rank of pilot officer, with simultaneous promotion to the rank of flying officer. Those who were graduates in medicine of one year or more might be promoted to the rank of flight lieutenant three months after the date of their appointment provided they had qualified at the School of Aviation Medicine or completed such other course or courses as might be designated. Candidates who were graduates in medicine of less than one year might be promoted to the rank of flight lieutenant three months after the first anniversary of the date of graduation provided they had qualified at the School of Aviation Medicine or completed other courses. A candidate who had held an appointment as a medical officer in any other defence force might be appointed temporarily to his previous rank, or to any higher or lower rank that the Minister might prescribe on the recommendation of the Chief of the Air Staff. When medical officers were recommended for special employment higher acting rank with pay and allowances might be granted if considered necessary.

The duties of medical officers varied considerably. The greatest number were directly employed in the care of service personnel. In February 1943, for example, approximately 68 per cent of R.C.A.F. medical officers in Canada were engaged in this work. The second largest group (approximately 14 per cent in February 1943) was occupied with the important duties connected with the recruiting centres. The remainder were employed at medical selection boards, research units, such as the clinical investigation units, command or Air Force Headquarters, and on special duties such as liaison work.

Their qualifications were sufficient for the usual requirements for the care of personnel, but in view of their special responsibilities with regard to aircrew they were required to take a course given at the School of Aviation Medicine.* The supply of specialists was not great and decreased as the war continued. There were 116 specialists in the Air Force in March 1943, but in certain fields there were not enough to meet the needs. Accordingly, the R.C.A.F. either organized courses or arranged for its medical officers to attend courses offered through outside sources in fields in which there was a particularly acute shortage.

An example of this was in the field of radiology. Four R.C.A.F. medical officers attended a 16-week course in medical radiology in 1943. This was given jointly by the Department of Physics, University of Toronto, and the Department of Radiology, Toronto General Hospital. Early in 1944 five others were trained when the course was given in its entirety at the Toronto General Hospital. A further five completed their training before the war ended. Fourteen of the 16 radiologists in the service were specially trained

* This course is discussed below, pp. 453-5.

during the war.* As the number of radiologists was limited, these officers could only be posted to the larger station hospitals. The consultant radiologist considered it necessary that the x-ray work on the smaller stations at which a radiologist was not employed should be supervised, and on his recommendation orders were sent to all commands that the radiological establishments be visited at least every two months by the radiologist most conveniently located. This type of supervision proved valuable especially by improving the technique of preparing and interpreting films.

Training in tropical medicine was also carried out, especially in the later stages of the war when plans were being made for the Canadian contribution to the war in the Pacific, and when it was generally recognized that there was a need for specialists in this field. Seven air force medical officers received training in this subject at the U.S. Army School of Tropical Medicine in Washington, D.C., prior to February 1944 and two were trained at the Institute of Parasitology, Macdonald College, Ste. Anne de Bellevue, Quebec, in the spring of the same year. When the opportunity arose to send more medical officers on the two-month American course in April 1944, a strong recommendation was sent from D.M.S. (Air) that this should be done "in view of the necessity of providing for possible operations in tropical areas".† This was agreed to and two medical officers proceeded to Washington. The course involved a study of the disease problems encountered in temperate, sub-tropic, and tropical climates, particularly as applied to and affecting military operations in these areas.

Arrangements were made to send a further eight on the course commencing at the end of August, and in November authority was sought to train more officers (including entomologists) and a number of laboratory technicians. In recommending this, D.M.S. (Air) noted that in addition to the need for medical officers for squadrons and higher formations, and for field hygiene officers, it was necessary to make plans to staff malaria survey units, malaria control units, and others, which the hard-won experience of the Allies in Asia indicated were required for adequate medical care. Although exact knowledge of the composition of the R.C.A.F. formations which might participate in the second phase of the war was lacking, it was deemed wise to assume that the force would be responsible for the care of a formation of the approximate size of a bomber group. Twenty-two medical officers, it was stated, had already received training in tropical medicine, two of whom had been posted to the two transport squadrons sent to India. At the moment, however, the R.C.A.F. was prepared to provide the services of only squadron medical officers which was inadequate to cope with the peculiar problems involved in operations in a tropical theatre of war.

* FEASBY, W. R., *Official History of the Canadian Medical Services 1939-1945*, Vol. II, p. 301.

† D.M.S. (Air) to A.M.P., 8 April 1944. HQ 450-M61, Volume I.

The recommendation was concurred in by the C.A.S. on 9 December, and the officers proceeded on the course early in the new year. Due to a lack of facilities the Americans were unable to accept the laboratory technicians. A further 14 medical officers were sent in April 1945 to take the course. Some thought was given in June to sending even more, but in view of the then reduced commitment in the Far East it was thought that the number already trained in this field would be sufficient.

At that time 39 had been trained at the U.S. Army Medical School. Three of these were now serving with R.C.A.F. squadrons in India, and of the remainder 20 had volunteered for service in the Far East. The services of the latter were not required due to the successful termination of the war against Japan in August.

Plans were made in the spring of 1945 to train one medical officer and two entomologists on a four-week field training course at the United States Army School of Malariology, Panama. These officers were to staff malaria control units, approval for the formation of which had been given by the beginning of 1945. At the end of July, when it was realized that the R.C.A.F. component in the Pacific would be much smaller than had been anticipated, the course was cancelled.

Some training was also given to medical officers in anaesthesia, psychiatry, the physiology of flight, air evacuation, and industrial medicine.* Short courses were offered in anaesthesia, and between 1943 and 1945 some 17 medical officers were employed as anaesthetists after taking a special four-months' course in Montreal.† Some medical officers were sent for training in psychiatry to the Toronto Psychiatric Hospital and the Montreal Neurological Institute in 1943, and at least three other officers received similar training in 1945. Short courses on the physiology of flight were held from time to time at the School of Aviation Medicine and at No. 1 Clinical Investigation Unit, Toronto; medical officers were instructed in the use of the low pressure chamber and in the demonstration of flying clothing and equipment to aircrew. Two medical officers were trained in the practice of air evacuation on a course given by the United States Army Air Force in Louisville, Kentucky, late in 1943.

A number of medical officers desired to receive flying training, and some of them seem to have succeeded in obtaining a certain amount of this from time to time as long as it was not found to interfere with their medical duties. A great deal of uncertainty existed about policy in this regard, and in response to an inquiry on the subject in October 1942, D.M.S. (Air) stated that while the Air Member for Training favoured medical branch personnel flying as passengers, he could not extend the privileges of training to them.

* Reference is made below to the course in industrial medicine, p. 456.

† FEASBY, W.R., Official History of the Canadian Medical Services 1939-1945, Vol. II, p.301.

The question was taken up more fully early in the following year when the deputy director sent a memorandum to the A.M.P. advocating flying training for medical officers and the authorization of some sort of flying badge for those who met the qualifications for it. He cited the D.G.M.S., R.A.F., who had stated that the advantages of such training lay in the appreciation gained by the medical officer of the relevant factors resulting from flying training and aviation in general: "The medical officer with wings can better apply aviation medicine to the service in regard to the physiological, psychological and hygiene aspects. These officers are able to assist in the instruction of members of aircrew in the proper use of certain apparatus, appliances and equipment used in flying".* In addition, the deputy director drew attention to a number of other advantages of permitting medical officers to take flying instruction. Experience in flying would be of assistance in the interpretation of medical standards for the selection of aircrew; the confidence between the medical officer on the one hand and trainees, instructors, and operational personnel on the other, necessary to the success of the branch in dealing with personnel problems, could be built up when the flyers knew that the medical officer had had flying training; the correction of various neuroses occurring in flying personnel depended upon early recognition and such recognition would be more likely if medical officers had some flying experience; personnel could be instructed in the proper and economical use of oxygen and protective clothing, in day and night vision problems, and in fatigue and measures designed to delay its onset.

The A.M.P. did not believe it feasible that all medical officers obtain wings, but suggested that a limited number of them might take flying instruction in order that they could be of use in research work on aviation medical problems. No action was taken, however, and what instruction there was continued to be on an unofficial basis.

Medical Associates

Another group which played an important role in the work of the branch was the one with the service designation *medical associate*. This group included commissioned personnel who had usually university or equivalent training in one or more of a number of allied medical sciences which were necessary to service medical practice and research. Included in it were biochemists, chemists, biologists, entomologists, ophthalmic assistants, psychologists, and some of the service pharmacists.† Most medical associates served on research projects at the various R.C.A.F. research centres such as the clinical investigation units and the nutritional laboratories.

In all, 47 medical associates‡ were employed in the R.C.A.F. during the war, 33 males and 14 members of the Women's Division. The female medical

* D.D.M.S. (Air) to A.M.P., 8 February 1943. HQ 471-5.

† For pharmacists, see pp. 442-6.

‡ Including two who served as medical administrative officers prior to 1944.

associates served as ophthalmic assistants. The latter constituted the largest single number within the group. A number of these assistants trained at a two-week course at No. 5 Initial Training School, Belleville, in January 1942, after which most of them were posted to medical selection boards where they were employed taking night vision scores of aircrew personnel. The majority of the medical associates, however, were fully qualified when enlisted, and the only others to receive some training were the entomologists, three of whom were sent on a course in tropical medicine at the United States Army School of Tropical Medicine, Washington, D.C., in January 1945.*

Dietitians did not belong to the medical branch, although they worked in close co-operation with it. They belonged to the messing branch, in the setting up of which D.M.S. (Air) played a large part. Liaison between the two branches was close and constant, and the dietitians followed the nutrition and food standards set by the nutrition experts of the medical directorate.

Medical Administrative Officers

Thirty-three administrative officers† served the branch during the war; 11 of these were women. They contributed by handling the great number of administrative problems which arose daily and which would otherwise have utilized the time and energies of medical men when they were needed so greatly elsewhere. The largest single number of administrative officers was on the staff of the medical directorate at headquarters in Ottawa; four were so employed in February 1943. There was usually one of them at each of the larger units such as the Technical Training School at St. Thomas, the personnel depot at Moncton, the stations at Trenton, Dartmouth, Gander, and Patricia Bay. One medical administrative officer was generally posted to command headquarters to provide administrative assistance to the P.M.O. Late in the war these officers served at some of the manning depots and at most of the convalescent hospitals. Some five of them served overseas.

Some medical administrative officers attended a two-week course in March 1943 given at the School of Aviation Medicine, Toronto, and at the R.C.A.F. Station, Trenton. Lectures were given on the responsibilities and duties of medical administrative officers at hospitals, on the organization of the R.C.A.F., the medical directorate, and station hospitals, and on a wide variety of medical administrative subjects including office organization, documentation, orders and publications, equipment, examinations, and the relationship of administrative officers to outside agencies such as the D.P. & N.H. and the Red Cross. Practical work was given in the station hospital at Trenton from where also visits were made to nearby unit hospitals. In order to fill established positions as medical administrators, 11 women officers

* See p. 430.

† Including two who became medical associates in 1944.

took a two-week course in March and April 1944 at the School of Aviation Medicine. A number of the graduates of this course were posted to R.C.A.F. convalescent hospitals.

Ancillary Medical Personnel

For the task of the care and treatment of the R.C.A.F. and the other Commonwealth trainees in Canada, the branch required a great number of medical tradesmen. In some cases, personnel already qualified in their trade were enlisted; they required only the usual military indoctrination and drill courses before entering upon their tasks. Some of these underwent initially a certain amount of contact training, that is, they learned something further about their trade, particularly as regards air force requirements, while working under the supervision of air force medical officers and nurses before assuming their full duties. But the greater number of personnel employed in medical trades entered the service untrained and consequently had to undergo courses of varying length and intensity before they could be of assistance to the medical branch. As a result a great deal of instructional work devolved upon air force medical officers.

There were, by March 1944, a dozen medical trades in the R.C.A.F. These were:*

| | |
|--------------------------------------|-----------------|
| hospital assistant..... | masseur |
| wardmaster | osteopath |
| radiographer | chef (hospital) |
| clerk medical (general, | optometrist |
| stenographic, and supervisory) | pharmacist |
| laboratory assistant..... | dispenser |
| technical assistant (medical) | |

All but four of these trades (wardmaster, technical assistant (medical), masseur, and optometrist) were open to both male and female personnel, although women were not employed in all of the other eight trades.

For the first year of the war a number of other rank medical personnel of the R.C.A.M.C. filled air medical requirements both on the detachments assigned to the Air Force and on station hospitals. The enlistment and training of these men was the task of the R.C.A.M.C. A limited amount of instruction was given to nursing orderlies, clerks, and dispensers, and a few x-ray technicians were trained in the Radiology Department of the Toronto General Hospital. By 1 July 1940 there were 270 other ranks of the R.C.A.M.C. serving the R.C.A.F. and the number rapidly expanded to reach 390 three months later. The majority of these transferred to the R.C.A.F. following the formation of the medical branch.

Once the new medical branch was functioning, it handled directly the question of medical tradesmen. With the expansion of the Air Force, great

* For pharmacists and dispensers, see pp. 442-6.

numbers of these were needed, and it was proposed to give a month's instruction for medical orderlies at various centres throughout the country. Standard training was to be assured, and there was to be a common examination. Courses were begun in the spring of 1941 at St. Thomas, Trenton, Regina, and Brandon. These appear to have met the needs at that time, and it was not necessary to resume training in this trade until October 1942. Further courses of four (later five) weeks' duration were then given at No. 1 Composite Training School, Trenton. Trainees were given lectures on organization and administration, and on a variety of clinical subjects some knowledge of which was needed for their duties. A large part of the course was given over to practical work in first aid and nursing procedures. Later, the practical aspects of the syllabus were gradually increased at the expense of lectures to constitute finally more than one half the course. The courses continued until November 1944. The trade was redesignated, apparently late in 1942, and personnel in it became known as hospital assistants. More personnel were mustered in the trade of hospital assistant than in any of the other medical trades: there were 1455 in February 1943.

Women were also employed as hospital assistants, and cared for both male and female personnel. Early in 1942 a four-week course of training for them was initiated at the Technical Training School, St. Thomas. The necessary instruction in medicine was given by a medical officer, a dental officer gave a lecture on oral and dental hygiene, a nursing sister taught the duties of hospital assistants, and a senior N.C.O. instructed on hospital organization, documentation, and related subjects. The course was temporarily discontinued in May 1943 when it was found that there were sufficient personnel in the trade, and when more were needed in September women candidates were sent to the male hospital assistants' course at Trenton. The trade of hospital assistant was unquestionably among the most useful of military employments open to women. With a surprisingly brief period of formal instruction, followed by contact training, the women hospital assistants quickly proved their worth and in general showed more aptitude towards such employment than men in the same trade.

A few hospital assistants, generally those with the greatest seniority who had shown proficiency, were able to remuster to the trade of wardmaster. The wardmasters were really senior hospital assistants, and were only called for in station hospitals of 75 beds or more. They were in charge of the other hospital assistants, and carried out some of the duties of the latter.

The R.C.A.F. also enlisted radiological technicians. Some were included among those who transferred after the separate medical service was formed. Personnel were trained in this trade intermittently as the need arose throughout the war on an eight-week course at the Toronto General Hospital. A third of the course was devoted to practical work. Women, too, were employed as radiographers and the proportion of W.D. trainees increased steadily after the beginning of 1943. Increased commitments in the field of

radiology for work at release centres and anticipated requirements for the war in the Pacific made it necessary to train eight radiographers as late as the spring of 1945. After completing their course, the radiographers were sent to the larger R.C.A.F. station hospitals for a period of two to six months' contact training before being allowed to take complete charge of a smaller x-ray department.

Medical clerks (general and stenographic) were also enlisted. Senior clerks were known as clerks supervisory medical. No medical training was given to the male clerks, but early in 1942 a course of instruction for women members of the trade was begun at No. 6 Manning Depot, Toronto. In this four-week course, the airwomen received the same instruction as clerks and stenographers for the first three weeks and lectures on medical documentation, administration, and organization in the last week. Those who succeeded in the course were employed chiefly at recruiting centres performing medical clerical duties and assisting in the medical examination of women applicants.

A number of personnel were already trained at the time of their enlistment. Among these were laboratory assistants. All hospitals of more than 55 beds had one laboratory assistant, and there were two of them for units of more than 200 beds. Some of the better qualified laboratory assistants undertook blood chemistry and pathological procedures as well as bacteriology at clinical investigation units and the larger medical establishments. The majority on smaller establishments did more elementary tests such as urinalysis, staining and preparation of microscope slides, and analysis of gastric contents. In view of the importance of this work, a review was made late in the war in order to make certain that it was being done by qualified personnel. Towards the end of the war in Europe some thought was given to training laboratory assistants in preparation for the war against Japan. It was proposed that trainees be given an initial course of one month's duration at St. Thomas, on completion of which those qualified would undergo a further one-month course in special procedures in tropical medicine at the Institute of Parasitology, MacDonald College, Ste. Anne, Quebec. This training was approved, but it appears that none was given. Arrangements were made in the spring of 1945 to train 25 medical technicians, whose trade was to be laboratory assistant, at a four-week field training course at the U.S. Army School of Malariology in Panama. They were to staff the projected anti-malarial units, but due to the reduced commitment in the Pacific theatre the course was cancelled in July 1945.

Late in 1941 the trade of technical assistant medical was instituted. The nucleus of the new trade was a group of laboratory assistants who remustered. The technical assistants did research work at clinical investigation units under the direction of medical officers and medical associates. They worked on routine carbon monoxide determinations, clothing research, acoustics research, and a wide variety of other projects. Some were low pressure

chamber operators. The technical assistants were posted also to medical selection boards where they were employed in the examination of aircrew candidates, i.e., in electrocardiography and electroencephalography and in the operation of the decompression chambers. A great number were posted to the Flying Personnel Medical Section at the "Y" Depot, Halifax, where all aircrew, having completed their training and been posted overseas, were re-tested in the decompression chamber.

Establishments were provided early in the war for a limited number of masseurs, and a few persons trained or experienced in the technique of massage were enlisted. They were employed at the larger station hospitals and, before the appointment of physiotherapists, at the convalescent hospitals. They continued to serve at the latter when the establishment for physiotherapists was not filled. In view of the scarcity of fully qualified physiotherapists in the last months of the war, it was proposed that a course of instruction and contact training in massage be given to personnel chosen from other medical trades. Successful candidates were to be remustered to masseur and used as assistants to the physiotherapists. The course was given at St. Thomas in June 1945, but after its completion it was not felt that it provided an adequate basis for remustering those who succeeded, and the majority were re-employed in their old trades. The total establishment for the trade of masseur was never very great; it stood at 28 in February 1945.

On administrative direction and against the advice of the medical directorate, a few osteopaths were enlisted. The trade was created in February 1943, and 15 months later there were eight osteopaths serving the branch. Establishments were not provided for them. As the qualifications for the trade were sufficiently similar to that of masseurs it was found expedient to carry them against the masseur establishment. Before they were enlisted it was stipulated that they were to work under the direction of the senior medical officer who was to decide the cases requiring their services. The responsibility for the care and treatment of personnel was to rest with the senior medical officer.

The medical branch also utilized the services of optometrists. The pressure of ophthalmic work at command boards in 1944 was such that assistance had to be obtained for the ophthalmologists. This was done by enlisting trained optometrists and placing one of them under each ophthalmologist, an arrangement which proved excellent. In all, some six optometrists were so employed.

The trade of hospital chef also existed. There was no special course for personnel in this trade. A selection was made from among those who had taken the course for R.C.A.F. chefs and obtained the highest grouping in their trade, and those chosen were remustered.

Consideration was given in the early part of 1945 to creating the trade of sanitary assistant. As part of the planning for the medical component of the Pacific force, D.M.S. (Air) began making arrangements in April 1945 for

the training of personnel for a mobile field hygiene section, a unit designed to take care of emergency installations or emergency repair and maintenance work in the sanitation field. It was to consist principally of a sanitary inspector and a number of sanitary technicians (plumber, carpenter, tinsmith, brick-layer, and cement worker) and sanitary assistants. The latter were to be remustered from other trades, medical and non-medical. Personnel were also to be trained as sanitary assistants for each squadron expected to participate in the Far East; they were to be responsible for the routine sanitary problems of the squadron. Plans to train them in field hygiene procedures at the Canadian Army School of Military Hygiene, Camp Borden, were cancelled when the Pacific commitment was reduced.

Some thought was also given in the last year of the war to creating an establishment for the position of sanitary assistant to each command hygiene officer. It was hoped to fill these positions with sanitary inspectors holding the Certificate of Sanitary Inspection (Can.) for whom, however, some additional training would be provided. No decision was taken before the war ended.

Some personnel in the trades of hospital assistant, clerk medical, and laboratory assistant served with R.C.A.F. units overseas, but the majority remained in Canada.

THE R.C.A.F. NURSING SERVICE

With all medical care for air force personnel initially an army responsibility, the services of a number of the nursing sisters of the R.C.A.M.C. were placed at the disposal of the Air Force. Throughout the latter part of 1939 and the early part of 1940 some of these sisters were posted to R.C.A.F. stations which were then being rapidly constructed across the country. On 1 July seven nursing sisters were on air force duties and by the end of September the number had grown to 12.

When the R.C.A.F. medical branch was created, provision was made for nurses in the original organization, and at a meeting of the Air Council on 28 November 1940 it was decided to call the section which the sisters would staff the R.C.A.F. Nursing Service. The 12 army nursing sisters serving with the Air Force were offered the choice of remaining in the R.C.A.M.C. or transferring to the R.C.A.F., and all 12 of them chose to join the service with which they had been associated. At the end of October the D.M.S. ordered that all future appointments of nurses would be made directly into the R.C.A.F.

The need for nurses was great in view of the rapid development of the Air Force. When the D.M.S. issued his order regarding nursing appointments there were already 24 flying schools in operation, in addition to a number of stations and ancillary units, and their numbers continued to grow each month. Recruiting proceeded swiftly and within six months of the formation of the medical branch the nursing service numbered 63. This

growth continued, and, almost two years later, in April 1943, there were 241 nurses serving in the R.C.A.F. Peak strength was reached in October 1944 when there were 395 nurses. In all, a total of 481 nurses served in the Air Force during the war.

The air force nursing sisters served on most flying stations and a great number of other units in all the commands in Canada. As no R.A.F. nurses were sent from England, Canada provided the nursing personnel required by British stations. In March 1943, when 24 R.A.F. units were operating under the B.C.A.T.P., 30 Canadian nursing sisters were serving on more than half of them. Sixty-eight R.C.A.F. nursing sisters were posted overseas. They served at Northallerton and East Grinstead, at a number of R.C.A.F. stations, and with No. 52 (R.C.A.F.) Mobile Field Hospital.

Nursing sisters in the Air Force, like their counterparts in civil life, occupied a position of great responsibility. Through the matron or the charge nurse, they were subject to the direction of the unit medical officer and were responsible to him for the care and treatment of the sick and injured. In addition to their regular nursing duties, the sisters afforded orderlies ample opportunity of learning their duties and, by teaching them what they could, endeavoured to awaken interest in all that pertains to nursing.

After nursing sisters became commissioned members of the R.C.A.F. in the summer of 1942, it was decided that they should participate in a short course, the syllabus of which would include subjects peculiar to the medical and nursing professions. A special course was accordingly organized for them. Its object was to give the nurses a thorough grounding in service organization and administration in addition to essential nursing procedure relative to air force medical work. Lectures were given on the organization of the R.C.A.F. and of the medical branch, on the position of the nursing service, service etiquette and customs, discipline, and office organization. There were also lectures given on medical administration and a wide variety of clinical subjects important in service, and particularly air medicine, medical documentation, medical stores, hospitalization, medical proceedings, hygiene and communicable disease control, the immunization programme, venereal disease, air sickness, crash procedure, physiology and treatment of shock, burns, and others.

The Course of Aviation Nursing — as it was known — was of three weeks' duration and was first given at No. 6 Manning Depot, Toronto, (afterwards known as No. 2 Composite Training School) and later at the School of Aviation Medicine in Toronto. The first course was held in December 1942 and several more followed until the autumn of 1943 by which time most of the nurses had passed through it. The course was resumed in July 1944 for the benefit of those who had enlisted in the intervening period.

Some training in air evacuation was given to Canadian nursing sisters late in 1943. Six nurses participated for approximately six weeks in a course given at the U.S. Army Air Forces School of Air Evacuation at Louisville,

Kentucky. They underwent a rigorous physical training designed to enable them to serve on active fronts. In addition to callisthenics, practice evacuations under simulated battle conditions were held, and training was given in pitching tents and in camouflage procedure. Some of the instruction was similar to that given in the Course of Aviation Nursing in Toronto. Special attention was given to air evacuation procedure, ambulance plane loading, emergency medical treatment, tropical nursing medicine, military hygiene and sanitation, map reading, and flight discipline.

For more than two years after its formation, the nursing service had no principal matron at Air Force Headquarters, and was thus left with no direction from the top. General supervision was provided by D.M.S. (Air). From time to time in the first months the one matron in the service, then located at St. Thomas, was consulted on subjects peculiar to the nursing service, and, in addition, the co-operation of the Matron-in-Chief of the army nursing service was obtained. In March 1941 a suggestion was made by the A.M.P. that it would be desirable to have a matron on the staff of the medical directorate in Ottawa, but D.M.S. (Air) did not consider this necessary at the time as the existing arrangement was satisfactory. Two months later he asked the D.G.M.S. that the co-operation given by the army medical directorate in permitting the Matron-in-Chief to assist occasionally with the Air Force be extended to allow her to visit R.C.A.F. medical units carrying nursing sisters. The Army agreed to carry out this extra work.

This system worked reasonably well so long as the nursing service remained small. With its continued growth throughout 1941 and early 1942, and the increasing burdens and commitments of both D.M.S. (Air) and the Matron-in-Chief, it became obvious that more direct supervision of the service was needed. In June 1942 D.M.S. (Air) accordingly asked for and received an increase of one matron in the establishment of the directorate. The post remained vacant until April 1943 when Nursing Sister J. E. C. Porteous assumed it. She was promoted matron in the following month and principal matron in April 1944.

There were some difficulties at first regarding the status of nursing sisters. For more than a year after the formation of the nursing service, its members were given the relative rank of officers but did not possess the status of officers; such relative rank did not carry with it the power of command exercisable by an officer with corresponding rank. This led to a number of difficulties over questions of discipline.

After members of the Women's Division were appointed to commissions early in 1942 it became imperative that the status of nurses should be clarified. Some consideration was given to transferring the nursing sisters to the Women's Division, but this gave rise to great concern in view of the pay and pension features for women personnel which were two-thirds that of male members of the R.C.A.F. As this rate of pay was less than that then being received by the nurses, such a move could only affect them adversely.

Moreover, many of the nurses objected to the idea of being removed from the direct control of the members of the medical profession. They felt that the plan to make them directly responsible to non-medical officers would be unworkable and might result in their having to break their professional code of ethics. Accordingly, this idea was abandoned, and it was decided that nurses should be placed in a new branch of the Special Reserve of the R.C.A.F. known as the Medical (Nursing Service) Branch. The difficulties attendant upon their lack of authority were overcome in May 1942 when a privy council order was passed authorizing the granting of commissions to members of the nursing service. Although not members of the Women's Division, the nursing sisters were, for the sake of uniformity, at first given W.D. rank titles. Despite this they were to be known and addressed, both officially and otherwise, as Nursing Sister or, where applicable, as Matron, rather than as Section Officer and Flight Officer.

There was still a great deal of uncertainty regarding their status. The fear existed that the nurses would yet be placed under the Women's Division and that like members of that branch be required to undertake a course of military drill. Moreover, the situation was further complicated by the opposition of the nurses to the idea of their having to pay the ordinary saluting compliments. Finally, in mid-November 1942, the Minister issued instructions that nursing sisters were to be granted ranks applicable to male officers, and two weeks later he assured the Canadian Nurses Association, whose aid had been enlisted, that drill would not form a part of the syllabus of the Course of Aviation Nursing and that sisters would not be called upon to salute.

The instructions as regards the change in rank were carried out immediately, but the formal promulgation of an order embodying the Minister's instructions on this subject was delayed because it was desired that a ruling on the question of saluting should be incorporated in it. The A.M.P. objected to the idea of making an exception of the nursing sisters to the general policy for women officers in the service. He argued that nothing would be more detrimental to the service than to have some female officers paying compliments and others not doing so, that it would be difficult for other ranks to distinguish between nursing sisters and W.D. officers and that all female officers in the service would be brought into disrespect if some of them did not return the compliments paid to them in the prescribed manner. He also maintained that drill should form part of the nurses' training. There was objection to their doing drill in view of the shortage of nurses both in the services and in civilian institutions and because of the nature of their work; as they were constantly on call to attend to the needs of the sick, it was felt that they should not be expected to drill and parade.

With no agreement on the subject of saluting reached by the following July the matter was left in abeyance and an A.F.R.O. was issued setting forth the ranks to be held by nurses. These were, in order of seniority, Matron-

in-Chief, Principal Matron, Matron, Nursing Sister, and Nursing Sister (Provisional), by which titles they were to continue to be known and addressed, and they were equivalent respectively to Wing Commander, Squadron Leader, Flight Lieutenant, Flying Officer, and Pilot Officer. The nurses were to receive pay and allowances prescribed for the equivalent R.C.A.F. rank (Non-Flying List).

In accordance with the Minister's instructions, nurses were not required to take a course in drill such as was prescribed for female officers in the Women's Division. The question of saluting was finally settled as the Minister had directed when, in March 1944, it was stipulated that nursing sisters were to pay and return compliments by turning the head and eyes and bowing the head in the direction indicated.

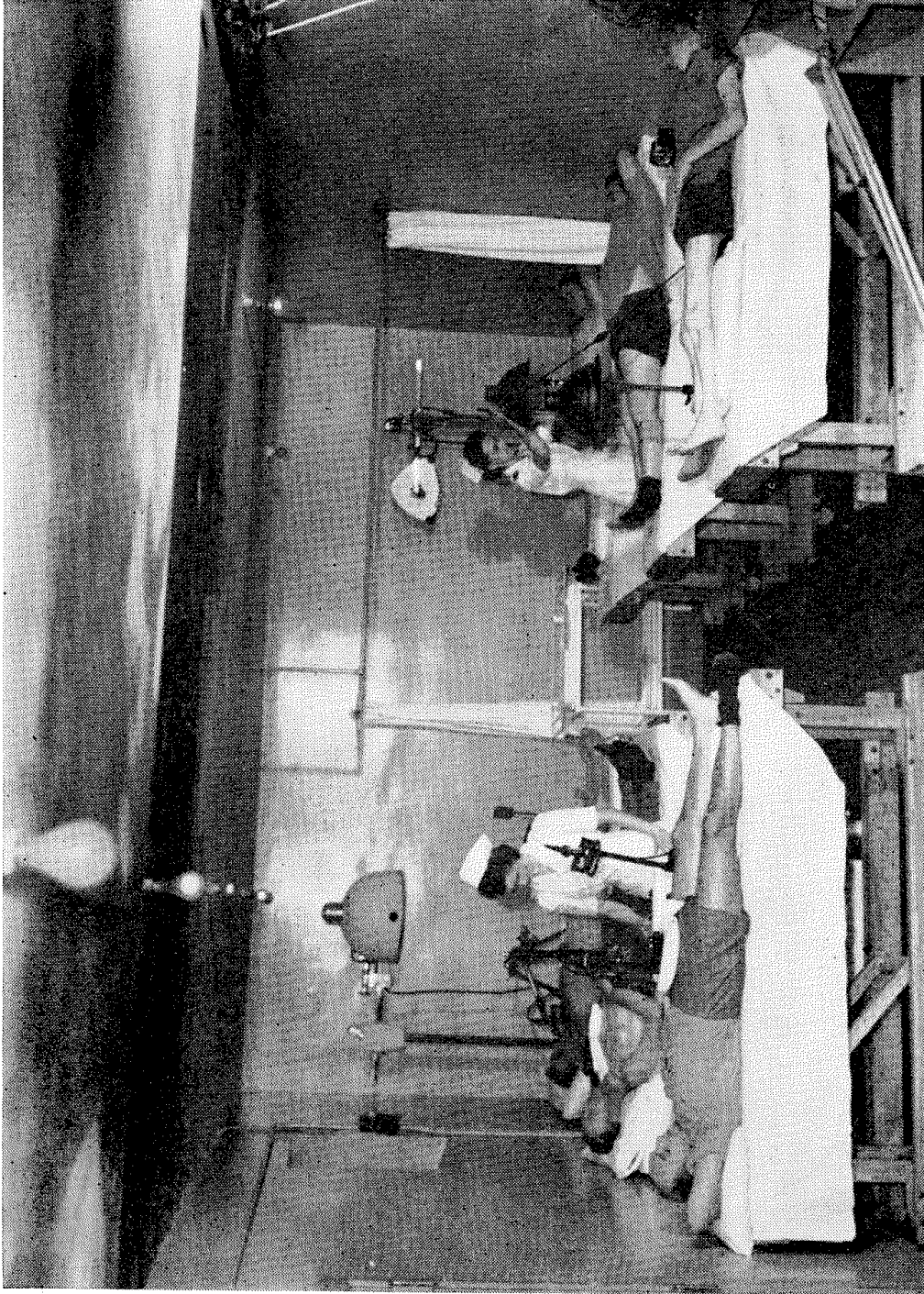
The wartime nursing service also included a few physiotherapists. The latter were not accepted into the R.C.A.F. until late in the war. Shortly after the formation of the medical branch, the Canadian Physiotherapy Association offered to help provide the R.C.A.F. with properly qualified physiotherapists. The association was informed that as existing medical units, D.P. & N.H., army, and civilian, were to be used for specialist treatment, the Air Force would not be recruiting physiotherapists, but that should the question arise at a later date the branch would be pleased to establish a close liaison with the association.

The question does not seem to have arisen again until late in 1943 when the Air Force decided to recruit physiotherapists. At that time an ultimate establishment of about 12 was foreseen. It was decided that they would be appointed to the service as nursing sisters, and that they would come under the same regulations and wear the same uniform as the registered nurses with the exception that the physiotherapists would wear a cap in place of a veil when on duty in the wards. All applicants were required to have the recommendation of the Canadian Physiotherapy Association. Three physiotherapists were appointed in March 1944, and a further four (including one who was a registered nurse as well) were appointed between then and the conclusion of hostilities in August 1945. The physiotherapists were posted to the R.C.A.F. convalescent hospitals and certain of the larger medical units, and were a valuable asset in the R.C.A.F. rehabilitation programme.

Provision was similarly made to appoint occupational therapists to the R.C.A.F. Like the physiotherapists, they were to form part of the nursing service. Although authority had been granted, none was appointed, and the occupational therapists serving the R.C.A.F. in the Second World War belonged to a civilian organization.

PHARMACEUTICAL ARRANGEMENTS

An important aspect of air medical arrangements was that relating to pharmacy. All R.C.A.F. hospitals were provided with a pharmacy which was staffed by either a dispenser or pharmacist or both. Establishments for



PHYSIOTHERAPY AT NO. 7 CONVALESCENT HOSPITAL,
NIAGARA FALLS, ONTARIO, AUGUST 1945

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station hospitals provided for one dispenser at 25-bed hospitals and for a pharmacist in all hospitals of 35 beds and over. Two pharmacists were required in units of 150 beds. Qualifications for pharmacists were higher than those for dispensers, but the duties of the two differed very little. The R.C.A.F. began to enlist personnel in both trades early in the war, and by February 1943 there were 78 pharmacists and 26 dispensers serving on units throughout the country. Their activities were loosely co-ordinated by the medical directorate at headquarters.

In the summer of 1943 the situation as regards the enlistment and employment of these personnel, as well as the handling and control of drugs was far from satisfactory, and a report which drew attention to the need for improvement in the pharmaceutical arrangements of the R.C.A.F. was prepared by the officer in charge of these matters. It was pointed out that drugs required expert handling, not only in the interests of maximum therapeutic value, but also in those of economy and conservation of supplies. In view of the existing illicit market price of many narcotic drugs, a consequence of the greatly restricted supply, and the resulting temptation for unlawful practices, greater control of them was required. With the facilities of the D.P. & N.H. and the R.C.A.F. nutritional laboratories and clinical investigation units available for the checking of drugs, and in view of the fact that a joint service committee was being formed, one of the functions of which was to ensure the maintenance of a high standard in drugs used in the three armed services, it was considered important that unit pharmacies should be efficient in every way. The report also noted a number of difficulties in regard to personnel which would have to be overcome before unit pharmacies could operate at maximum efficiency. A number of tradesmen listed as pharmacists had not produced evidence of graduating in pharmacy, and others had not established the fact they were in good standing in any of the provincial pharmaceutical associations. Frequently the qualifications of pharmacists were assessed by N.C.Os., a method, it was noted, which seldom brought to light all pertinent information at the beginning of service careers. Although the larger hospitals had dispensers or pharmacists, the report stressed that there were other units in the R.C.A.F. where the amount of dispensing and the responsibility for narcotic and dangerous drugs were such that a graduate pharmacist was warranted.

To effect the desired improvements it was suggested that a senior pharmacist officer be appointed in the directorate at Ottawa. He would be responsible for all R.C.A.F. pharmacies, for the educational standards and legal qualifications of pharmacists, for issuing instructions to pharmacists on standards of practice to be maintained in the Air Force, and for liaison with various bodies concerned with the checking and control of drugs. To carry out his duties better, the pharmacist officer would visit all R.C.A.F. stations and become familiar with the situation on them. These suggestions met with a favourable reception by D.M.S. (Air) at the end of July 1943, and

the officer in charge was designated a pharmacist officer, although a decision on whether there was any need to create such a position was left until a further study of pharmacy problems had been undertaken.

The pharmacist officer thereupon undertook a visit to a large number of R.C.A.F. units in the course of which he consulted with medical officers and pharmacists in order to determine methods of improving pharmaceutical practices and began to reassess the qualifications of pharmacists and dispensers. On his return he drew up a report which, after noting some of the careless practices which had developed at some of the unit pharmacies, recommended that a directive be issued listing specific bad practices to be avoided, that the duties of pharmacists include a weekly tour of all places on the station where drugs might be kept in order to ensure that they were potent, correctly labelled, and stored with adequate precautions against error, that rigid narcotic controls be established, and that the pharmacist officer visit units in each command at regular intervals. It was also suggested that the qualifications of all pharmacists in the service be the subject of further review.

A number of these recommendations were soon acted upon. On 3 December, a D.M.S. Circular Order was issued, the purpose of which was to put an end to the bad practices which had been noted by the pharmacist officer on his tour. Included among the worst faults to be avoided were: unlabelled bottles, inaccurate labels, deteriorated or contaminated drugs being allowed to accumulate, failure to take adequate precautions to guard against error, failure to use correct methods for storage of drugs, and too free access to the pharmacy by unauthorized personnel. In order to prevent objectionable practices, pharmacists were to inspect all drugs on the unit weekly. Where the establishment did not provide for a pharmacist, the senior medical officer was to ensure that these orders were carried out, and, if necessary, to supervise the dispenser in the fulfilment of them.

Instructions were issued to all medical officers, pharmacists, and nursing sisters covering the handling of poisons and potential poisons used at R.C.A.F. medical units. Specifications for all drugs and chemicals for medical use were revised.

The most pressing matter, however, was that of narcotic control. Having been advised by the Opium and Narcotic Drug Branch, D.P. & N.H., that a critical situation existed with regard to supplies of narcotic drugs in Canada, and that available stocks were low and replacements unobtainable, the directorate, in December 1943, warned all commands that the utmost conservation in keeping with therapeutic necessity was indicated. The restricted supply had given rise to a fantastic increase in the price of illicit narcotics. In July 1943, for example, the legitimate price of morphine and heroin was about ten dollars an ounce; in the illicit market the same quantity was worth \$8700. This in turn had been a further inducement to criminals, and the number of thefts had increased markedly.

The directorate next turned its attention to this important question, and in February 1944 a Routine Order was issued on the subject of narcotic drugs. Provision was made for their safekeeping in the pharmacy and on the wards, and for only a limited number of persons, the senior medical officer, pharmacist or dispenser, and in certain cases the nursing sister in charge, to have access to them. All issues of drugs were to be made on prescription only, dated, and signed by a medical officer, and a record was to be kept of these. On the first and fifteenth of each month a check of narcotic drugs was to be made, and any surplus or deficiency was to be reported with full details through the P.M.O. to A.F.H.Q. At units where there was no medical officer, the safe-keeping and issue of narcotic drugs was the responsibility of the commanding officer. Finally, provision was made for the transmission of narcotics in accordance with the Opium and Narcotic Drug Act.* They were not to be forwarded through the mail but were to be transmitted by registered express. When kits containing narcotic drugs were issued from Central or District Medical Stores or from units, they were to be sent without the drugs, which were to be issued directly to the senior medical officer of the unit concerned.

When reports were received at headquarters that some medical officers were still unaware of the serious situation regarding narcotics, a further reminder on the subject was issued at the end of February. It was pointed out that less than 50 per cent of the 1943 narcotic drug consumption was available for service use in 1944. The unnecessary prescribing of all narcotic drugs was to cease, and special security precautions against theft were to be taken by all units in view of the losses that had occurred.

In conjunction with these measures to improve pharmaceutical practice and enforce stricter control of narcotics, efforts were made to solve personnel problems. During the tour of the pharmacist officer in the autumn of 1943 a beginning had been made to the task of reassessing the qualifications of service pharmacists. This was continued in the following months and in the course of the investigations it was discovered that six of these were not legally qualified to practise pharmacy in a Canadian province, or did not possess equivalent qualifications, a condition now insisted upon by the R.C.A.F. The six N.C.Os. in question were precluded from further promotion. Meanwhile, the trade of dispenser was closed; only fully qualified pharmacists were to be considered for dispensing positions.

In April 1944 a determined effort was made to have establishments for pharmacists up-graded to bring their ranks more closely into line with their educational qualifications and service responsibilities. Warrant officer, first class, was the highest rank attainable by pharmacists at this time. It was argued that the volume and responsibility of the work required of pharmacists was increasing with the advance of modern therapeutics. This was particularly

* The provisions dealing with the transmission of narcotic drugs were largely a recapitulation of those in an earlier order.

true in hospitals where a command medical consultant was attached. An especially serious responsibility was placed on pharmacists in view of the critical situation with regard to narcotic drugs. The pharmacist officer pointed out that:

Unlike other trades in the R.C.A.F., pharmacists are strictly regulated by Provincial Pharmacy Acts and the Federal Opium and Narcotic Drug Act. Deviations from these regulations could involve not only service penalties but also the possibility of being struck from the rolls of Provincial Pharmaceutical Associations. In addition, certain offenses against these and other acts particularly applicable to the practice of pharmacy carry with them severe criminal penalties.*

The fact that pharmacists entered the service fully qualified in an important and highly specialized work was advanced as an additional reason why they should be given higher rank. An up-grading of establishments in all hospitals with more than 40 beds was called for, and in hospitals of 150 beds or more the request was made that the top rank be raised to flying officer. The justice of the claim was appreciated and although it was not agreed that there should be a general up-grading of all pharmacist establishments, the proposal to delete one N.C.O. pharmacist and add one flying officer pharmacist at seven of the larger hospitals was concurred in. In accordance with this decision, seven N.C.Os. were chosen to fill the new establishments. After attending a basic training course in the fall of 1944, supplemented by lectures on hospital administration, medical documentation, pharmaceutical practice, and medical stores, these men were commissioned as medical associates (pharmacists).

In keeping with the stricter control and supervision which it was intended to exercise over unit pharmacies, efforts were made to effect a more centralized control. Permission was sought and obtained early in 1944 to establish positions for two commissioned pharmacists at headquarters. As noted above, one officer had been acting in the capacity of pharmacist officer since July 1943. These officers were responsible to D.M.S. (Air) for maintaining a high standard of pharmaceutical practice in the R.C.A.F. The practice of visiting units periodically to see that all pertinent regulations were being carried out was continued, and co-ordination of the activities of the units was thereby effected.

Thus from the impetus given in the summer of 1943 by the appointment of an officer to deal exclusively with pharmaceutical questions, a vast improvement occurred in this aspect of air medicine. The subsequent activities of this officer, and later those of his associate, and the co-operation given him by officers in the directorate at headquarters, principal and station medical officers, and unit pharmacists and dispensers, had the desired effect of raising the level of pharmaceutical practice throughout the service.

* M.A. 2 to D.D.M.S. (A), 18 April 1944. HQ 421-M68, Vol. 1.

MEDICAL BOARDS

Recruiting Centre Medical Boards

The initial medical problems which arose from the B.C.A.T.P. were those of selection and categorization. The medical boards established at recruiting centres in the first months of the war faced this task as best they could, but they were severely handicapped in a number of ways. There were large numbers of recruits and too few doctors to staff the boards. Of those available, few had had any experience in aviation medicine. There were difficulties, too, in that no common interpretation of medical standards had yet been built up. The causes of rejection often reflected the former civilian interests of the medical officers.

The experience gained in the first weeks of the war by the Pilot Selection Board, established in Air Training Command in September 1939, and by other boards throughout the country, was utilized in plans to improve the working of medical boards which would ensure careful medical categorization and prevent unnecessary wastage from purely medical causes. In order to remedy the situation, it was necessary that all medical officers become acquainted with the medical standards for aircrew personnel. Accordingly, it was decided to emphasize these and the medical examination for fitness for flying at the course for medical officers at the School of Aviation Medicine which was organized in the spring of 1940. Sufficient time was to be allowed to permit the new officers to become familiar with the various procedures and their interpretation. On graduation from the school a large percentage of the doctors were sent to various recruiting centres which were opening across Canada. This, in addition to correspondence, visits, and conferences, tended over a period of time to make for uniformity of interpretation.

It was decided that all medical examinations were to be fully completed and not terminated with the finding of a defect or disease which would prevent enlistment. Medical examination returns were forwarded directly to the directorate in Ottawa for study. Close supervision of the work of the boards was maintained by D.M.S. (Air).

Until late in 1943 the medical form used by these boards in the examination of all recruits was the M2. At that time, when there were a number of changes in medical examination and selection, it was superseded by a new form, M1, which made provision for a physical profile by which a man's functional ability could be readily assessed. This profile included seven attributes: vision, colour vision, hearing, hands, arms, legs, and other factors. The minimum degree of function allowable for each of these attributes, with the exception of the other factors, was graded as 1, 2, and 3. All applicants for both aircrew and groundcrew accepted at these boards were given a basic A4B category.

Medical Selection Boards

The determining factors in final Medical selection were to a great extent those requiring the judgement of a specialist, and it was decided to form boards — known as medical selection boards — composed of these. As there was a limited number of specialists available, the boards were at initial training schools where the nonmedical selection of aircrew was made. Each board was responsible to the station commanding officer for pay and discipline but reported directly to D.M.S. (Air) on professional matters.

The specialists included an ophthalmologist, an otolaryngologist, a surgeon, and an internist. Each board had one medical associate. In addition, there were a number of other ranks including clerks to handle general office duties and a technician capable of doing the more elementary laboratory tests.

The medical selection board had two main functions: the chief one was the selection of candidates for aircrew; the other was to act as a board of consultants for recruiting centres and flying stations in its area. In addition, the boards carried out a certain amount of clinical and psychological research relating to medical selection.

The board gave a careful physical recheck of each member of aircrew during his course at the initial training school and the results of this were entered on the airman's original M2 form. After 1943 a different form, M2A (examination for fitness for flying), was substituted for the M2. An additional copy of this form was made and forwarded to A.F.H.Q. together with a take-off form upon which was coded the pertinent data from the form and which was used to facilitate statistical research.

In addition to the purely physical examination, an attempt was made to assess each man's mental ability and personality. This assessment was made primarily by the medical officer who took the history and conducted the general physical examination, but also to some extent by the other medical officers during their portion of the examination, and by the president of the board in a brief interview with the airman at the conclusion of the examination. An attempt was made to assess the following points: mental alertness, intelligence, motives for enlistment, co-ordination, reliability, and emotional stability. Such descriptive terms as the following were customarily used in summing up this assessment: mature, immature, tense, nervous, stable, confident, over-confident, determined, assured, reserved, self-conscious, capable, unreliable, and unimpressive. By thus forming an estimate of the airman's character and stability, an idea could be gained of his relative fitness for one or other of the positions in aircrew, and the board's opinion on this was entered on the man's documents together with his own first choice. The airman was then assigned his aircrew medical category.

At the conclusion of each course a selection board meeting was held under the presidency of the station commanding officer. This board consisted of the officer commanding the training squadron, the flight commanders, the

officer commanding the link training squadron, the president of the medical selection board and, usually, a representative from command headquarters. A chart was prepared showing marks attained by each airman in his various courses, an estimate of his personality made by his flight commander, his medical category, and the position in aircrew for which he wished to train. Whenever possible the airman's own choice was given first consideration, but in doubtful cases, such as where the individual's academic marks were low or his personality was such that he was considered unsuitable for that particular position, he came before the selection board for a personal interview, and a final decision was reached at that time.

In September 1942, selection was moved back one stage to manning depot, and there came into being a manning depot selection board with a medical component. From this time the medical selection boards at I.T.Ss. re-examined only pilots and navigators.

The other main function of the medical selection board was to act in a consulting capacity in doubtful or unusual cases from recruiting centres and flying stations in the vicinity. It was in this capacity that the presence of well-trained specialists was of the greatest use. Work done for recruiting centres consisted mainly of colour-vision examination on the Edridge-Green Lantern, but also included examinations of cases of borderline ocular muscle balance, ear and nose problems, investigation of cases with history of hay fever, asthma, suspected epilepsy, and many others. Referred cases from flying stations were principally those of airsickness, eye or ear conditions and, occasionally, suspected epileptics.

The duties of the president of the board were many and varied. In addition to acting as a consultant with other members of the board on doubtful or unusual cases and to his responsibilities as a member of the selection board, he handled the administrative side of the board's work. The latter included routine correspondence, the preparation of reports, and communicating to the members any change in policy or standards of which he had been informed by headquarters. He interviewed each airman briefly at the conclusion of his examination and assigned him his category; he also wrote a brief note on the airman's mentality and personality. He maintained liaison with the principal medical officer of the command, the Director of Medical Services (Air), the Re-selection Board, which was responsible for the re-distribution of *ceased training* aircrew, the medical officers at nearby recruiting centres and flying stations, and, at Nos. 1 and 2 T.T.Ss., with the clinical investigation units. Finally, he undertook such research as he saw fit or was directed to do by headquarters.

The other members of the board, in addition to their routine work in the examination and physical assessment of airmen, and to their activities as consultants in their respective fields, could undertake research into any particular problem provided they were able to do so without interfering with

their routine work. At some medical selection boards it was the practice for the otolaryngologist to visit the larger flying stations from time to time to operate on ear, nose, and throat cases.

Through the reports of the Re-selection Board, which was located originally at No. 1 Manning Depot, Toronto, and afterwards at No. 1 Composite Training School, Trenton, and through occasional visits made to flying stations by the president, the board was able to follow up any unusual or interesting cases. Ceased training cases were reviewed in the light of the reports of the Re-selection Board, and an effort was made, by a review of the medical examination done by the medical selection board, to determine whether the "wash out" should have been or could have been predicted. Cases such as those of nervous instability and borderline ocular muscle balance were followed through the elementary training stage and the knowledge gained in this way was of value in assessing later cases.

A system for following up the course of an individual airman in training was devised which provided the required information as to success or failure and standing on a single form which was completed by and remained under the control of the medical officers. This data came directly to the Directorate of Medical Services at A.F.H.Q. where it was analyzed and transferred to punch cards for statistical study and record.

Command Medical Boards

In the early years of the war, the R.C.A.F. in the interests of economy utilized to a great extent the specialist services of the D.P. & N.H. It was, therefore, considered unnecessary to appoint consultants within the service. For a number of reasons this arrangement was not regarded as satisfactory by the medical branch, and in September 1943, in a memorandum to the A.M.P., D.M.S. (Air) proposed that a consulting medical board, composed of R.C.A.F. specialists, be set up in each command. Each board was to be associated with a large hospital provided with the necessary equipment and laboratory facilities.

In his memorandum setting forth the reasons for the creation of the new boards, D.M.S. (Air) pointed out that the R.C.A.F. was in the peculiar position of being responsible for the medical care of its personnel and yet having many of its professional functions carried out by an organization not under its authority. Lacking a specialist professional organization, it was unable to direct and control the level of medical practice carried on by its medical officers. This was especially important in view of the fact that almost one half the medical officers of the R.C.A.F. were under 30 years of age and consequently lacked professional experience. These young officers were placed in positions of clinical responsibility on small station hospitals before they had had an opportunity to acquire this. D.M.S. (Air) thought that they should be under the guidance of well qualified specialists in order to carry out their duties in the best interests of the service.

Moreover, he stated that the success of the arrangement with the D.P. & N.H. depended upon the ability of the latter to continue to supply professional assistance, and for a number of reasons the department had found it increasingly difficult in the preceding months to do this. Its responsibilities to discharged personnel had increased, and at the same time there were fewer consultants on its staff. A large number of the consultants were on a part-time basis, and as a great proportion of medical men had been withdrawn from civilian communities into the armed services, the civilian commitments of these consultants had increased to such an extent that they were unable to handle adequately civilian, D.P. & N.H., and service demands. Finally, many of the D.P. & N.H. consultants were veterans of the First World War and their ranks had been further depleted by retirement.

D.M.S. (Air) indicated that the D.P. & N.H. was willing to place at the disposal of the Air Force certain of its hospital and laboratory facilities and to turn over to it the responsibility for the treatment of its personnel in D.P. & N.H. hospitals. In anticipation of the necessity of assuming full professional control of its patients through the appointment of consultants and the assumption of this responsibility, the medical branch conducted an experiment along these lines in No. 2 Training Command in the spring of 1943. It operated 150 beds at the D.P. & N.H. Deer Lodge Hospital and provided the medical and other necessary staff. The principal purpose of the hospital was to provide medical attention for R.C.A.F. patients in the Winnipeg area, but it was also used as a medical consultation centre for the command. Seriously ill patients from stations throughout the command were referred there. Junior medical officers were selected from the surrounding stations and posted to the hospital where they worked under the specialists for three months. The specialists, in addition to their work at the hospital, visited the station hospitals within the command, examined cases and advised station medical officers on the care of their patients. The experiment was described as highly satisfactory.

D.M.S. (Air) pointed out that if the arrangement followed in No. 2 Training Command were applied to all commands, economical and efficient professional care of air force personnel would be provided. There would be a decentralization of the control of medical treatment to commands where actual treatment and disposal could be more rapidly and efficiently carried out. Action could be taken on cases without the necessity of written reference to A.F.H.Q. Matters of policy and co-ordination of the boards would be under the control of D.M.S. (Air); the boards would interpret and carry out the policy. In addition to constituting a body which could supervise the level of medical practice within the command by visiting station hospitals and having medical officers work directly under them, the consultants would be an authoritative body through which matters of professional policy could be instituted under R.C.A.F. control. They could direct the further education and clinical experience of junior medical officers. The principle of combining

the function of consultants to direct the professional activities in commands with their use as part of the staff of an R.C.A.F. hospital organization (either in an R.C.A.F. hospital itself or in a D.P. & N.H. one having R.C.A.F. patients) was cited as another advantage of the suggested arrangement. The importance of the boards was also emphasized in view of the increase in the number of individuals repatriated for medical reasons. This number would be greatly expanded when hostilities ceased, and it was argued that these cases should be rapidly decentralized from the repatriation centre to the area of their own homes, an arrangement which could be accomplished if there were a board in each command to assume responsibility for treatment.

In October D.M.S. (Air) submitted a further memorandum with the proposed establishments for the boards. These were the same for each command, with the exception of Western Air Command which was considerably smaller than the others, and included the president (wing Commander), an internist, a surgeon, a neuropsychiatrist, an ophthalmologist, an otolaryngologist (all squadron leaders), a medical adjutant (flight lieutenant), and an ophthalmic assistant (section officer). In Western Air Command five rather than eight officers were called for: the president was required to be an internist, the functions of the ophthalmologist and otolaryngologist were combined in one eye, ear, nose and throat specialist, and there was no medical adjutant. The establishment for other rank personnel was to be the same in all cases and to consist of four clerks medical, one laboratory assistant, one optometrist, two technical assistants medical, one hospital assistant, and one general duties. The formation and proposed establishments of the boards met with ministerial approval on 19 November, and the boards were established before mid-December and in operation soon after that.

The establishment arrangements on the whole were satisfactory, and there were only a few minor changes in these subsequently. With the consolidation of two of the training commands and the prospect of further changes in this regard, the designation of the boards was altered in December 1944 when they became known as "Regional Medical Boards".

The boards were responsible to the principal medical officer of the command in which they were located. Their duties included approving most medical board proceedings within the command, advising station medical officers concerning the diagnosis and treatment of their patients, regulating the practice of medicine in the commands by visiting station hospitals and assuring themselves that the most recent methods of investigation and treatment were employed and that the records and the care of patients were of a high standard, training medical officers, and acting as a consultant staff to the command hospitals to which difficult cases requiring investigation and treatment unavailable in station hospitals were referred.

The boards functioned with great success for the remainder of the war and during the period of demobilization. Gradually the medical and surgical treatment of R.C.A.F. personnel in each of the six commands became

centralized around them and the hospitals with which they were associated. Many local problems arose from time to time but these were overcome. The work of the boards not only ensured better medical care but was a great stimulus to the morale of medical personnel everywhere.

Release Medical Boards

After the middle of 1944, when it became obvious that there were more than sufficient trained aircrew available and the intake of personnel was sharply cut, the medical branch began to be faced with the problem of examining personnel who were to be discharged. Release medical boards, each of which was equipped for complete medical assessment, were set up at the release centres across Canada. A complete digest of the individual's medical history during the time of his service was available as were x-ray and laboratory facilities; extensive medical record sections were established, and sick quarters for the treatment of short term disabilities were provided. Specialists were available for consultations, and rapid assessment of large numbers was made. Certain referrals were made to hospitals for detailed study when required.

The granting of a period of pre-discharge leave provided for the assembling of documents in most cases, and the work of accurate assessment proceeded with efficiency and dispatch. The objective was to investigate, evaluate, and record the state of health of all personnel leaving the service, to co-ordinate the findings with plans for re-establishment in civil life, and to provide the Department of Veterans' Affairs with a dependable reference point for future use. In all of these aims the work of the medical branch was integrated with that of other agencies concerned with the administration of a comprehensive post-discharge, re-establishment programme.

THE SCHOOL OF AVIATION MEDICINE

It was recognized early in the war that the nature of air medicine and the problems peculiar to the enlistment and care of flying personnel required that all medical officers entrusted with these matters should undergo a course of instruction in them. The formation of a training depot or college for the instruction of all medical personnel concerned with the care of the R.C.A.F., but which would particularly stress the medical aspects of aviation for medical officers, was recommended in November 1939 in the report advocating the organization of a separate air force medical service.* Early in 1940 the School of Aviation Medicine was formed in Ottawa on the authorization of the D.G.M.S. Candidates, of course, were qualified as doctors of medicine and the course was designed only to supplement their medical training so that the particular problems associated with flight would be understood and appreciated. An additional function of the school at a

* See p. 340.

later date was to supply, by means of medical bulletins and revision of existing publications, up-to-date information on aviation medicine. Any information which headquarters considered useful was distributed, generally in the form of D.M.S. orders.

The first course of the school commenced on 8 April 1940 and was of four weeks' duration; 41 medical officers attended. The syllabus was a heavy one. Some instruction was given on the organization and administration of the R.C.A.F., on the theory of flight, and on methods of flying instruction. There were lectures on the relationship of the R.C.A.M.C. with the Department of Pensions and National Health, the St. John Ambulance, the nursing service, dental problems, nutrition, equipment and supplies, and radiology. But the bulk of the course was naturally concerned with the purely medical problems which the doctor was expected to meet in his task of examining and caring for flying personnel. There were lectures on the medical examination for fitness for flying, so important in the selection of aircrew, the psychological aspects of personnel selection and flying training, the physiology of respiration, the effects of vibration, cold, heat, wind, light and ventilation in flight, the effect of flight on the ear, speed, acceleration and gravity, air-embolism, anoxia in aviation, the effects of diminished atmospheric pressure and of ascent and descent, airsickness, oxygen in aviation, flying accidents, emergency surgery, treatment of shock, the physical requirements and duties of the various air force personnel, and on physical standards. Flights in aircraft of the type used for elementary instruction were arranged in order that the problems of initial flying instruction might be appreciated and the importance of the medical examination for fitness for flying more clearly seen. The instructional staff consisted of service officers, both medical and non-medical, and certain civilian medical men. The medical instructors were generally actively engaged in medical selection, clinical investigation, and research.

It was recommended that, in view of the fact that they were qualified to deal with medical problems in service flying and that their special knowledge in aviation medicine would be available for civil aviation after the war, successful candidates of each course be issued certificates of qualification in aviation medicine and that distinctive letters after the individual's name be placed in the militia list. The issuing of the certificate received the concurrence of the Chief of the General Staff on 21 May 1940. No action was taken, however, to implement the request regarding the letters. Similarly, a recommendation two years later to have the letters "Av. M." appear after the names of successful candidates failed to win acceptance.

In November 1940 the school was moved to Toronto where access could be had to technical equipment not available elsewhere. The school was accommodated at No. 1 Manning Depot, but late in 1941 it was moved to No. 6 Initial Training School. Facilities of No. 1 Manning Depot, the University of Toronto, the Toronto General Hospital, No. 1 Initial Training

School, the Banting Institute, and the Toronto Recruiting Centre were all utilized at one time or another. At the manning depot there was practice in immunization procedure and medical documentation. No. 1 Medical Selection Board supplied members to assist in the demonstration of the examination for fitness for flying in the out-patient department of the Toronto General Hospital. The low pressure chamber at the Banting Institute was used until the one at No. 1 Clinical Investigation Unit was operating. Candidates visited the Toronto Recruiting Centre for the purpose of observing the operation of a recruiting centre and of assisting in the performance of examinations upon recruits.

In Toronto the first two courses each ran for six weeks, but from July 1941 the courses were reduced to the usual four. The syllabus underwent a few modifications from time to time as experience dictated. By early 1942 lectures had been added on fatigue and stress, night vision, ceased training problems, electroencephalography, aviation medicine statistics, tropical diseases, gas warfare, pension procedure, and examination of and problems concerning applicants for the Women's Division.

The only other change of importance to the syllabus came early in 1943. In December of the preceding year D.M.S. (Air) had proposed that the administrative subjects on the course be dropped from the syllabus. In view of the organization of an officers' training school at Ste. Marguerite, it was considered that these subjects could best be dealt with there rather than on a course primarily medical in nature. This was agreed to, and it was arranged that medical officers were to attend the officers' training school at Ste. Marguerite prior to going to the School of Aviation Medicine.

Until March 1942 the School of Aviation Medicine was not established as such. Early in 1942 it was requested that it be established at No. 6 I.T.S. It was thought that it should be properly constituted in view of its importance in the training of medical officers who had not had previous experience with flying. One medical squadron leader adjutant and one clerk medical were required. The adjutant had been held supernumerary to the establishment of No. 6 I.T.S.; the only increase in fact was the clerk who was being borrowed when possible from the strength of No. 6. It was pointed out that no new construction was required. Ministerial approval was given to this move on 25 March. Subsequently, in May 1943, the establishment of the school was increased by one flight sergeant, clerk supervisory medical, one corporal, clerk steno medical, and one aircraftsman, general duties.

Aside from the regular course for officers new to the service, the school periodically offered courses in more advanced aspects of air medicine, refresher courses of one sort or another, and courses in special subjects related to air medicine. A course for nine selected officers with operational station experience was given in the spring of 1942 in order to acquaint them with some of the newer developments in respect to oxygen equipment, carbon monoxide, cold, and protective clothing.

When it was realized that a considerable hazard existed at the repair depots, a special course of instruction in industrial medicine was arranged by the school, in the summer of 1942, in co-operation with the Industrial Hygiene Division of the Ontario Department of Health. Many members of the staff of the Industrial Hygiene Division gave lectures in aspects of this subject. The medical officers who took this course were posted to the repair depots to institute industrial health programmes. The regular course at the school in September of the same year was extended to five weeks in order that aspects of industrial medicine and hygiene could be included.

A refresher course of one week was begun in August 1943. There were lectures and discussions on visual and hearing problems in flight, the physiology of oxygen, oxygen equipment, flying accidents, airsickness, flying clothing, neurological and psychiatric problems, and venereal disease control.

A two-day course for flying instructors was held in October 1943. This included demonstrations on the Accelerator and the Link Trainer, flying clothing, carbon monoxide, intercommunication equipment, and the Evelyn Night Vision Trainer, lectures on air sickness and tenseness in trainees, and a symposium on flying accidents.

When accommodation was available, the facilities of the school were opened to medical men of the other armed services and from allied nations. In December 1942 the Army requested that selected R.C.A.M.C. officers be permitted to attend the regular course, a knowledge of aviation medicine being considered of value in view of the advent of airborne troops. Arrangements were made for two of them to attend the course beginning in March 1943. Arrangements were made for six medical officers of the R.C.N. Fleet Air Arm to attend the course offered in July 1945. The naval medical officers' duties aboard light fleet carriers included the care of flying personnel, and it was thought desirable that they have some knowledge of air medicine and the physiology of flight. In addition to the greater number of the usual lectures given to R.C.A.F. medical officers, they were given a series of demonstrations at No. 1 Clinical Investigation Unit on oxygen equipment, flying clothing, acceleration and blackout devices. An R.A.F. medical officer in Canada in connection with the B.C.A.T.P. attended the course in the spring of 1943, as did also a medical officer of the Royal Norwegian Air Force.

The last regular wartime course was begun in July 1945. By the end of the war most of the medical officers of the branch, including the women doctors, had passed through the school. The training they received there proved invaluable when they came to face the problems of service medicine and particularly those associated with flying personnel. At the end of the war, when a number of medical units were consolidated into one for reasons of efficiency and economy, the school was joined with No. 1 Regional Medical Board, the clinical investigation unit, the mobile bacteriological laboratory, and No. 1 Nutritional Laboratory to form the Institute of Aviation Medicine.

The primary function of the institute was to co-ordinate and integrate all medical and medical research activities from which medical policy, medical standards, and instruction in aviation medicine would be formulated.

PHYSIOLOGICAL TRAINING OF AIRCREW IN CANADA

The indoctrination of potential aircrew in the R.C.A.F. was early thought to be a matter of importance. Consequently, at all initial training schools decompression chambers were installed, and familiarization flights in these chambers were given to demonstrate primarily the proper ventilation of the ears during descent from actual flight and secondly to demonstrate the deleterious effects of lack of oxygen at heights above 10,000 feet. It was felt that this minimum instruction was required at this stage in training in order that aircrew could have the demonstrations made in perfect safety under the control of medical selection boards. Additional reasons for placing the decompression chambers at initial training schools were that the transition from initial training school to elementary flying training school was so rapid and that flying time was felt to be so valuable at the E.F.T.S. level. At no time was it felt that this was adequate physiological indoctrination for finished aircrew but rather that it served as an introduction to the subject and as a very necessary pre-flight stage of training.

The setting up of 12 decompression chambers at the large "Y" Depot at Halifax was intended not entirely as a research and selection project. While aircrew were categorized as to their ability to withstand decompression sickness during potential high-altitude flights, there was also a very important aspect of this work which dealt with training in the use of oxygen, especially that of putting each man on his own responsibility on these very long and slightly hazardous simulated flights at 35,000 feet. In this sense, then, there was very valuable physiological training given at the "Y" Depot from its inception.

When, late in 1943, it became clear that the number of aircrew from Canada likely to fly at altitudes high enough to experience decompression sickness was to be very small, the chambers at "Y" Depot were closed and dispersed to those parts of the country where it was felt they would be most useful. In areas in which operational flying was being conducted there was an obvious need and decompression chambers were set up at No. 2 Flying Personnel Medical Section, Sea Island, Vancouver. On the east coast, R.C.A.F. stations at Dartmouth, Yarmouth, Torbay, and Gander had decompression chambers installed.

The remaining chambers went largely to operational training units where it was felt that graduates of the B.C.A.T.P. were likely to accumulate in great numbers. In order to save their time and to bring them to the highest state of preparation for participation in the war, it was decided to give them thorough physiological training embracing oxygen and high altitude training

in decompression chambers, night vision training, lectures on acceleration and deceleration, first aid, survival in the Arctic and the tropics, and basic information on malaria and other tropical diseases. As part of this programme decompression chambers were set up at Nos. 3, 5, 6, 7, and 8 O.T.U.s., located respectively at Patricia Bay, B.C., Boundary Bay, B.C., Comox, B.C., Debert, N.S., and Greenwood, N.S. Additional chambers were placed at the R.C.A.F. stations at Rockcliffe, Trenton, and Moncton, and at the Flight Engineers School, Aylmer, Quebec.

In January 1944 a medical officer with overseas experience and with special interest in physiology was placed in charge of a co-ordinated training programme to bring the physiology of flight before aircrew in a very direct and personal manner. He required the assistance of approximately 36 medical officers for instructional work. As far as possible officers of the extrovert type, good mixers, and capable speakers were chosen, and two training courses of one month each were arranged at the School of Aviation Medicine. Some of these flying personnel medical officers, as they were known, were posted overseas. A large number of technical assistants medical, from the "Y" Depot in Halifax and from certain medical selection board installations which were being closed, provided a pool of trained technicians capable of manning the decompression chambers. A number of medical officers and medical associates received special contact training in night vision training techniques at the R.C.A.F. Biophysics Laboratory at McGill University. A number of female medical associates were trained in this laboratory, both in the preparation and repair of night vision training models and in their demonstration and teaching use in the field. These officers did an excellent job in the field and deserve a very great deal of credit for the success of the Canadian night vision training programme.

Beginning on 1 July 1944, No. 2 F.P.M.S. carried on week-long courses for operational aircrew in Western Air Command. Some of these aircrew were employed in sea trials of the R.C.A.F. plastic-coated, nylon ditching suits. From R.C.A.F. Station, Sea Island, to R.C.A.F. Station, Yarmouth, therefore, a group of medical officers, seconded especially to the physiological training work, carried on their courses being allowed a very broad degree of latitude in their treatment of the subject. Some devised demonstration rooms where protective clothing and survival gear was brilliantly displayed. A few had complained that they had no desire to take part in the course at Toronto or in the eventual teaching on stations. These were dropped from the scheme because of their poor effect on morale. One was found to have had bilateral otitis media and thought to be extremely unsuitable for continued decompression chamber work. He also was released from the group of instructors. Nothing could better point up the extreme care required in the selection of medical officers whose duties bring them into teaching contact with aircrew. In general the aircrew were most receptive. Occasionally

a commanding officer was encountered who believed the programme was nonsense; in one such case the decompression chamber made only 30 runs.

Despite these shortcomings in the scheme, the work was well done and was valuable. In particular these physiological training installations proved of great value in bringing to the notice of aircrew the most recent Canadian, British, and American developments. After the Americans entered the European theatre in large numbers and with different equipment, training concerning the alternate systems of oxygen, intercommunication, and heated clothing became of major importance.

One extremely valuable outcome of the work was that aircrew no longer pleaded ignorance of their oxygen equipment and its use, for they knew that opportunities were at hand, under medical supervision, for complete indoctrination in this matter. Whereas at an early stage of the war only a few instrument men among the other ranks knew or cared anything about oxygen, by the end of the war a large body of men whose work took them into the air constantly or occasionally had been trained in emergency use of oxygen, if in nothing else. Many commanding officers on whose stations the physiological training installations were placed were quick to recognize the value of the curriculum for all air personnel, and in some cases flying personnel medical officers were kept extremely busy teaching.

The planning for Phase II proceeded actively in the spring of 1945 in the office of D.M.S. (Air). Conferences were held with A.M.P., A.M.T., National Research Council representatives, research workers from No. 1 Clinical Investigation Unit, Toronto, and others, concerning the equipping of a small, high-altitude laboratory and physiological training centre in Okinawa. It was proposed that the two-man decompression chamber at the Montreal Neurological Institute, the property of the National Research Council, should be shipped to Okinawa as a minimum requirement. Naturally, the tropical disease and tropical survival aspects of physiological training bulked large in this planning.

An estimate of the value of this training would be hard to make on a detailed follow-up basis. The aircrew given this training were dispersed all over the world. A collection was made by the Director of Physiological Training of reports of anoxic episodes which occurred in Canada, over the North Atlantic, or in Britain. These were circulated in the interests of prevention and caused a great deal of discussion in crew rooms. Special Canadian posters were prepared giving physiological details and psychological prods to aircrew on oxygen and on other matters. In simplest terms the physiology of flight was taken out of the clouds and put squarely in front of each aircrew member as a life-prolonging measure.

The R.C.A.F. made a series of excellent films relating to the physiology of flight. The pioneer film on oxygen was still in use ten years later. Two other films, Gen on "G" and "G" Hygiene, were made at the Accelerator Unit

of No. 1 C.I.U. Also made at No. 1 C.I.U. was a film on pressurized breathing, called *Boost for Breathing*. This was taken overseas and used in conjunction with lectures to Canadians in photo reconnaissance units.

The subject of night vision training did not lend itself well to pictorial representation on a film but an excellent manual was written on the subject which greatly helped in the presentation of the subject in specially built trainers. The training in night vision consisted of three major parts: (a) practice in scanning a large panorama at low light intensities; (b) instruction on the appearance of targets under various phases of the moon, both land and water targets; (c) instruction in cockpit illumination. This was thought by many to be a major contribution by the medical branch of the R.C.A.F. to the armamentarium of training methods for use by the Allies.

Many instances could be cited on the value to aircrew of this training in aviation physiology. One which comes to mind most vividly concerns oxygen training and its value. The pilot of a photo-reconnaissance mosquito noticed that his navigator's speech had become "reedy" and slow just after reaching an altitude of 32,000 feet. In less than a minute the navigator collapsed, and the pilot dived for home base. The symptoms suggested anoxia, so the pilot inspected the navigator's oxygen system and found that the mask had become disconnected from the tubing. Knowing the danger at this altitude, the pilot with great difficulty pulled the navigator to the floor and held the end of the oxygen tubing under his nose. Two minutes later the navigator's colour improved, although even 40 minutes after landing forcible restraint was still necessary. The prompt action taken by the pilot based on his knowledge of aviation medicine undoubtedly saved the life of this airman.

CO-OPERATION WITH OTHER CANADIAN MEDICAL SERVICES AND WITH ALLIED AIR FORCES

While the medical services of each of the three armed forces were separate and autonomous to a considerable degree, they co-operated with each other in a number of fields with a view to better medical care and economy in administration. There was extensive collaboration in the provision of hospital facilities in Canada where, in view of the frequent stationing of personnel of two or all services in the same location, there was danger of duplication. In December 1940 a committee consisting of the heads of the three medical services and the Director of Medical Services, D.P. & N.H., was convened for the purpose of reporting on the state of service and D.P. & N.H. hospital facilities and arrangements. The committee came to be known as the Inter-Departmental Committee on Hospitalization. Its membership was increased in May 1942 to include the Deputy Minister of National Defence (Army) and a representative of the Treasury, and its name was changed to the Wartime Committee on Hospitalization. It was agreed that

regular meetings would be held twice a month, and at the same time its scope and authority were increased. The Committee dealt with all projects involving additional hospital accommodation. Through its efforts the use made of hospital and auxiliary services was improved.*

With the shortage of medical men, all services made every effort to economize and use those available to the best advantage of the nation's war effort. Through the Canadian Medical Procurement and Assignment Board, instituted in 1942, the three medical services co-operated with civilian agencies in attempting to provide a proper distribution of doctors to meet both civil and service requirements.† There was an exchange of professional personnel among all three services, especially during the latter months of the war, in order to share experience. A special field of co-operation was that of venereal disease control.‡ The teaching facilities of each of the three services were available to all in order to avoid duplication of effort in this field.§

The services collaborated in the embarkation and disembarkation of drafts of personnel moving overseas and returning to Canada. The R.C.A.M.C. was nominally in charge of all medical aspects of this procedure, but in fact an R.C.A.F. Liaison Embarkation Medical Office handled most movements of air force personnel. This officer kept in touch with the R.C.A.M.C. Embarkation Medical Officer. It was found that through this system R.C.A.F. personnel requiring hospital treatment could be sent expeditiously to air force hospitals rather than to the nearest hospital in the dock area. Moreover, in this way air force medical authorities acquired some knowledge of the conditions under which their personnel were travelling. Large and difficult movements of personnel were thus carried out to everyone's satisfaction. There was occasional duplication of effort, but less than would have been the case had the R.C.A.F. attempted any individual system. When there were medical officers of two or more services on a troop ship, the general practice was for the most senior in rank to be nominated senior medical officer of the ship.

In order to avoid duplication of supply services, all medical branches drew equipment and drugs from Central and District Medical Stores. These units were under army control. They were stocked with supplies for each of the three services, and provided these as needed to the Navy and Air Force.

The three services and the Department of Pensions and National Health (after October 1944 the Department of Veterans Affairs) collaborated in the production of a journal containing articles and other information of clinical and service medical interest. This useful and informative joint services

* The committee's work is discussed at greater length above, pp. 63-70,

† See Chapter 28 for a more detailed account of the work of the board.

‡ FEASBY, W. R., *Official History of the Canadian Medical Services, 1939-1945*, Vol. II, p. 112.

§ For air force teaching facilities made available to navy and army medical officers, see p. 456.

publication — known as the *Journal of the Canadian Medical Services* — was issued every second month from November 1943 until January 1947.*

Close liaison was maintained with the medical services of allied air forces. This was effected through the posting of liaison officers and by exchange visits of senior medical officers. Co-operation was especially close among the Commonwealth countries participating in the B.C.A.T.P. Liaison medical officers from the United Kingdom, Australia, and New Zealand were stationed at the Air Liaison Missions of those countries in Ottawa throughout the greater part of the war. They were consulted on and helped in the solution of a multitude of medical problems which arose in connection with airmen from their countries training in Canada. The R.C.A.F. was closely integrated with the R.A.F. overseas, and this necessitated co-operation between the medical branches of the two services. There was close co-operation with the R.A.F. in air medical research and for a time an R.C.A.F. medical officer worked at the R.A.F. research laboratories at Farnborough, England.

Liaison was also close with the American Army Air Force medical service. An American officer was working at the Banting Institute before the United States entered the war. R.C.A.F. medical officers visited the United States periodically and profited from American research and experience. It has been noted above that personnel of the branch were trained in the United States in a variety of air medical subjects especially in 1944 and 1945.†

R.C.A.F. MEDICAL STATISTICS SECTION

Canada

Provision was made for a medical statistics section when the directorate of medical services was created at the end of 1940. The control of all medical recording and statistical matters was centralized in the section, which became responsible for the tabulation and analysis of all routine statistical returns.‡ During the course of the Second World War, certain medical statistical reports were produced regularly by the R.C.A.F. Medical Statistics Section at Air Force Headquarters. The function of these reports was to provide a guide in medical administration and to assist in the application of disease control measures and in the planning and distribution of professional services.

Included under this heading are the following:

- (a) Weekly Infectious Disease Summary.
- (b) Weekly Summary of Hospitalization.
- (c) Monthly Report of the Medical Statistics Section.
- (d) Highlights on the Health of Air Force Personnel.
- (e) Monthly Statistical Report on the Incidence and Prevalence of Venereal Disease.

* FEASBY, W. R., *Official History of the Canadian Medical Services, 1939-1945*, Volume II, P. 397.

† See above, pp. 430-1, 439-40.

‡ R.C.A.F. medical statistical data are in Volume II, Chapter 35.

The Weekly Infectious Disease Summary covering R.C.A.F. experience in Canada was supplied by fast mail to all commands each week, accompanied by a copy of the statistical summary for Canada prepared by the Vital Statistics Branch of the Dominion Bureau of Statistics. This arrangement afforded command hygiene officers a complete and timely picture of the incidence of infectious disease among air force personnel in Canada as well as among civilian personnel throughout Canada and the United States. The Weekly Summary of Hospitalization was used for medical administrative purposes by D.M.S. (Air) and provided an up-to-date picture of hospital case load and morbidity trends.

Preparation of a monthly report on health statistics was initiated in 1941, forming a major part of the Monthly Report of the Medical Statistics Section. This practice was subsequently modified and a separate and more extended statistical review was prepared and released under the title *Highlights on the Health of Air Force Personnel*. This report included current and comparative medical statistics in all fields of interest, including recruiting centre rejections, current hospitalization and sickness trends, current incidence and trends in infectious diseases and venereal disease, hospital facilities and their utilization, convalescent hospital care, surgical operations, discharges on medical grounds, chest x-ray findings, repatriations for medical reasons, and mortality. These two reports were maintained up to October 1945.

The Monthly Statistical Report on the Incidence and Prevalence of Venereal Disease was initiated early in 1942 and continued to October 1945. This report included current and comparative data on the incidence, prevalence, and distribution of venereal disease and was distributed to all competent R.C.A.F. and B.C.A.T.P. medical authorities. Both this report and the monthly report on health statistics previously described were regularly sent to medical officers at all R.C.A.F. and R.A.F. units and formations in Canada.

In addition to these formal statistical releases, there were prepared also a large number of memoranda for administrative use as well as many special analytical studies on particular problems. *

To meet requirements in particular fields, special studies and statistical analyses also had to be made from time to time. These special studies were made with the approval of D.M.S. (Air) and fall into two main categories: general health topics, and aviation medical problems including medical selection. Certain of these studies were released in a special series of Air Medical Statistical Circulars.* Copies of these releases were provided routinely for the information and reference of all medical officers in Canada. Some of the statistical circulars dealt with data already available in monthly and weekly reports, but others presented information secured as a result of special inquiry. Illustrations in this category include wastage in aircrew

* Copies of these are on file at Air Force Headquarters.

training due to medical reasons, findings in the medical re-examination of aircrew at medical selection boards, and the post-enlistment incidence of tuberculosis.

The Medical Statistics Section likewise conducted, alone or in collaboration, a number of special investigations, formal reports on which were submitted to the Associate Committee on Aviation Medical Research, National Research Council.*

Overseas

In February 1940, it was proposed to utilize all available services and Ministry of Health hospital and sick attendance facilities for the R.C.A.F. personnel in the United Kingdom in accordance with the system already prevailing. Since R.C.A.F. medical documentation was in many respects the same as that of the R.A.F., it was decided, in order to avoid confusion, that R.A.F. forms and returns should be used. It was also agreed that copies of the relevant forms and returns should be sent to R.C.A.F. Headquarters, London, for action by the Principal Medical Officer, appropriate instructions being circulated by D.G.M.S./R.A.F.

To implement the agreement regarding medical records of R.C.A.F. personnel, a directive, dated 12 April 1940, was issued to the R.A.F. and other stations in the United Kingdom. This was the key directive which established the basic pattern for the entire war period. It required that all forms in respect of R.C.A.F. personnel were to be clearly marked at the top in red ink, "Canadian — R.C.A.F."

Arrangements were also made for Ministry of Health Form EMS 105,† Ministry of Pensions Envelope (MPE47), and other medical documents received by the R.A.F. Medical Statistical Office relating to R.C.A.F. personnel in civilian hospitals, to be passed to the R.C.A.F. Overseas Headquarters. R.C.A.F. Overseas Records Office was then being established to handle all the medical records as well as other documents for the R.C.A.F.

Under the plan, also, separate daily sick books were to be maintained at all stations where R.C.A.F. personnel were stationed, SO book 135‡ being used for this purpose. These books included entries for all ranks of the R.C.A.F. and were maintained in accordance with Air Publication 1269.§ All such daily sick books were to be retained at stations until called for by higher authority.

The various medical documentary procedures developed were the result of joint discussions and any changes from R.A.F. procedures were made largely to meet special R.C.A.F. and D.P. & N.H. requirements.

* Copies are on file at the R.C.A.F. Institute of Aviation Medicine, Toronto.

† Case Sheet, Ministry of Health, Emergency Medical Service.

‡ Daily Sick Book.

§ Manual for Medical and Dental Officers of the Royal Air Force.

The R.C.A.F. Medical Statistics Section Overseas was formed in November 1941, the personnel consisting of one officer and one other rank. Prior to this time, conferences were held with Air Ministry (MA3) and the R.A.F. Medical Statistical Office, Ruislip, at which arrangements were made for office space, and for an announcement that the R.C.A.F. Medical Statistics Section was functioning. The submission of separate forms R.A.F. 38, Weekly Sick Return, being rendered on R.C.A.F. personnel was also discussed.

During October 1941, a short period was spent at Air Ministry (MA3) by one of the R.C.A.F. statistical personnel, working with each sub-section therein before going to R.A.F. Ruislip. In the latter part of November 1941, three additional personnel were posted to the Medical Statistical Office and the extracting of data from forms R.A.F. 38 was begun, commencing with the returns for October 1941. The section at this time completed medical boards and nominal rolls of boards on repatriation, and compiled forms R.A.F. 241* and R.C.A.F. M17† from returns forwarded by the Medical Statistical Office, Ruislip.

For a time, an individual card system covering hospitalization and other medical data was maintained for all R.C.A.F. personnel overseas. This provided a complete record of the medical aspects of an individual's service. This procedure was advantageous, but was discontinued because it required a prohibitive amount of time to maintain it.

Data on hospitalization of R.C.A.F. personnel in the Middle and Far East were at this time extracted at the Air Ministry from all Canadian documents passing through MA 3.

In March 1942, an officer was detached from R.C.A.F. Headquarters to Medical Statistical Office, Ruislip. In August 1943, the Medical Statistics Office was moved from Ruislip to R.C.A.F. Headquarters, 32 Lincolns Inn Fields. From September 1943, a whole succession of changes in personnel, plus inexperienced staff and increased work, resulted in the medical returns coming several months in arrears. The chief problem was inadequate supervision and direction of personnel.

During the first three months of 1945 a thorough review of the R.C.A.F. medical recording and statistical arrangements at Headquarters, at R.C.A.F. units and No. 6 (R.C.A.F.) Group, and at R.A.F. units to which R.C.A.F. personnel were attached, was carried out by the officer in charge, Medical Statistics Section, R.C.A.F. Headquarters, Canada, and a comprehensive report with recommendations was made to the D.M.S., R.C.A.F. Overseas.

The statistical section was then reorganized, staff with special training and experience in the field of records and statistics were added, and calculating equipment secured. A new procedure was established for handling the

* Weekly Summary of Sickness in Command.

† Monthly Return of Admissions, Discharges, Transfers, Deaths, and Hospital Days.

records of completed hospitalizations held by the Medical Statistics Section and the statistical activities broadened to include medical repatriations, medical boards, as well as all phases of morbidity statistics.

During 1945, arrangements were effected for the transmission to Canada of all available original medical records, x-ray films, and R.A.F. card forms (39, 43, and others*) routinely. These documents upon arrival in Canada were placed in the individual R.C.A.F. Records Office files for the personnel concerned.

The wartime experience with the R.C.A.F. medical records and statistical system overseas emphasizes the need for adequately trained personnel and competent direction in such work throughout. Most, though not all, of the problems encountered could have been avoided with the early assistance and direction of personnel with an aptitude for work in this field.

Waste of time and serious delay in completing and transmitting reports to Canada — in most cases too late to be of much service — could have been averted had statistical direction been able to be provided at the outset. Not until March 1945 did the Director of Medical Services, R.C.A.F. Overseas, have available a summary of the current medical experience of R.C.A.F. personnel overseas and therefore an accurate idea of the prevailing morbidity, mortality, repatriation, or discharge rates.

* R.A.F. Form 39, Hospital or Sick List Record.
R.A.F. Form 43, Manuscript notes for completing Form 42.

OBSERVATIONS ON THE R.C.A.F. MEDICAL BRANCH

The principal features of the organization and work of the branch, and its chief contributions to the health and welfare of air force personnel, have been recorded in the preceding chapters. Many of the lessons learned as a result of experience have been remarked upon in the narrative. The following points concerning the branch are of special interest and importance.

Representation to higher authority. The newly developed R.C.A.F. medical branch soon encountered one of the problems common to all medical services in armed forces; it found it difficult to place its advice before sufficiently senior authority to have it implemented. It became evident that representation of medical opinion in important professional matters is necessary at the highest administrative level. The autonomy of a medical service is difficult to define but is of sufficiently great importance to the nation that medical authorities should have the highest representation possible.

Organization of a headquarters directorate. The organizational pattern of the medical branch emerged after much experience, being divided into administrative and professional divisions. Medical and administrative problems came to be so extensive that it was very difficult to combine these functions in one person. The administrative and professional aspects were well handled within the branch by doctors with special qualifications in individual fields. It is frequently assumed that the administrative aspects might be effectively carried out by non-medical personnel and that employment of medically qualified administrative officers is wasteful of manpower. Experience, amply confirmed in civil life, suggests that while the assistance of lay administrators is most valuable, the key medical administrative posts must be filled by medical officers.

Autonomy in overseas theatres. In the United Kingdom, where the R.C.A.F. was for a large part of the war almost entirely integrated with the R.A.F., a situation was created which should be forestalled. The R.A.F. was responsible for medical care of Canadians serving with the R.A.F. or in R.C.A.F. units. There were only a few small R.C.A.F. medical units functioning in the United Kingdom or on the Continent, and R.A.F. hospitals provided most of the definitive care. Excellent as this care undoubtedly was, it was given in surroundings, and in a way, sufficiently unfamiliar to Canadians to make many of them dissatisfied. It will be most important in any future conflict where R.C.A.F. personnel serve abroad to see that they are provided with care in their own medical institutions to the greatest extent commensurate with the size of the force and the availability of medical personnel. At the very least co-ordinate, joint service hospitals should be established for

the treatment of armed forces personnel. Had such a policy been in force throughout the Second World War, many of the differences and frustrations which arose, in spite of every effort to provide liaison between those providing the care and those receiving it, might have been avoided.

Authority of A.F.H.Q. It became evident during the Second World War that overseas formations tended to develop their own autonomy and authority. It was possible at great distances and with inadequate communication and liaison to ignore or to circumvent policies established at National Defence Headquarters. This situation is obviously undesirable. The closest co-operation should exist between formations serving abroad and National Headquarters in order that policies and practices be uniform.

Moreover, despite instances of excellent co-operation, liaison was not adequate during the Second World War either with Canadian formations or with those of our allies. With rapid advances in medical knowledge such liaison is assuming ever greater importance and the value of exchange officers in Allied Headquarters from each side is of great significance.

Medical manpower. Many problems relating to manpower were encountered in the medical sphere. There was a great shortage of trained specialists which seriously affected the air force medical branch since it only implemented hospitals for definitive treatment late in the war when other services had absorbed many of the specialists. It is, therefore, most important to acquire the service of such specialists and to see that adequate provisions are made for their training in future wars. Special attention should be given to the training of officers in the treatment of tropical diseases; such knowledge is of great value in peacetime and would be invaluable in the event of global operations when such diseases might well be encountered. The development of service hospitals to provide adequate professional opportunities and clinical experience for doctors is an important part of the professional training programme. Such hospitals can also be utilized for the training of radiographers, laboratory technicians, nursing personnel, and medical administrative officers. There should indeed be a training centre for these personnel at or near a service hospital.

It was observed during the war that some air force medical officers became dissatisfied with their lot in the service, and some thought should be given to the factors from which this discontent arose. In particular, it may be said to derive from isolation on stations remote from medical centres and other medical officers. Many doctors left their civilian occupations for national service in the expectation of serving overseas. The requirements of the B.C.A.T.P. made it necessary to retain in Canada, often at isolated stations, a large proportion of the total strength. Consequently, there were very few opportunities for service abroad, and movement was very limited. There was not a great deal of illness on flying stations, and constant attendance upon groups of airmen who were in good health and who had only minor illness served to make even the most enthusiastic of these young medical officers

dissatisfied, The alternative for many of them was service on one of the medical boards; some medical men also grew impatient with this form of occupation after a time. With few hospitals until late in the war only a limited number of R.C.A.F. medical officers had much opportunity to have more complicated clinical experience than that offered on medical boards or on a training station. This situation might have been rectified by the inclusion of more hospitals for definitive treatment within the air force medical sphere, or by greater exchange of duty with the sister medical services. Whatever the best remedies may be, they must certainly be implemented before any future medical service operates on a large scale; the high morale of its medical personnel is indispensable to its efficient functioning.

Some of this discontent might have been avoided had the exigencies of the service been explained as fully as possible to medical officers on appointment. Many had been specifically assured that they would be sent overseas, and air force medical requirements at home had not been sufficiently stressed. Medical officers realized that many other highly trained service personnel were not given the opportunity to practice their professions during the war, and the restrictions placed on their own activities might have been accepted more readily had service requirements been made clearer. Information on service opportunities should be made as accurate as possible and promises and assurances should not be made when there is the slightest doubt of their being able to be fulfilled.

Immunization. The control of communicable diseases was a major problem for the armed forces, and in the Air Force many experiences with epidemics of scarlet fever, respiratory diseases, and others, showed the importance of quarantining personnel after movement and the value of a sound immunization programme. Furthermore, adequate housing with proper hygiene, pest control facilities, and education in personal hygiene were shown to be of great importance. The loss of training hours, personal illness, and disability cost many times the amount which it would have cost to protect personnel in adequate accommodation and with proper advice. Crowding in barracks was proven to be most unwise and should be avoided at all costs in future campaigns. The medical officers responsible for preventive medicine and hygiene, whether at A.F.H.Q. or at C.H.Q., should have sufficiently high rank that their advice will not be ignored.

Medical statistics. A valuable contribution was made in the development of an effective medical record and statistical system and in the production of useful, practical medical statistics. These developments were initiated immediately upon the formation of the medical branch in November 1940 and came into full effect during 1941 with the application of modern methods of machine tabulation and the development of standardized forms for securing the basic information. Further extension and refinements were introduced during the years 1942-44. These included the development of regular reports on key subjects and the production of special releases in particular fields, for

example, aircrew medical wastage statistics, rehabilitation data, and industrial disease and injury statistics. The R.C.A.F. undoubtedly provided leadership during the Second World War for Canadian medical services' statistics and gained valuable experience upon which to build future medical record and statistical methods and procedures. Some of the practical results of these efforts are reflected in the air force statistical data in Volume II, Chapter 35, and in those relating to B.C.A.T.P. personnel in Chapter 23 of this volume.

Rehabilitation. The development of programmes and institutions for the rehabilitation of the sick and injured was a most satisfactory undertaking from all viewpoints. The impetus of war made possible the advancement of knowledge in the whole field of rehabilitation, and the conservation of manpower was well demonstrated. It was shown that men could be returned to duty earlier and better fitted than was possible without the aids of a properly operated convalescent or rehabilitative centre. The effects of proper diet and nutrition during convalescence were well and repeatedly illustrated, and these lessons need application to armed forces and to civilians alike.

Unification of the armed forces medical services. Much discussion occurred during and after the war about the need for three separate armed forces medical services. Complete unification initially presents itself as a reasonable and feasible solution but, like many complex problems, closer examination discloses it to be difficult and impracticable. Close integration of the three armed forces medical services is desirable and was achieved to a reasonable degree after the first irritations engendered by separation had passed. Whether continued integration could or should ever lead to amalgamation is a matter which time and experience alone can show. At the close of the war, when service morale had reached a peak in the Army, Navy, and Air Force, it seemed that physical reunion of the three sister medical services was improbable at any point in the future; since that time many former officers have come to believe that such union is desirable, but those with most intimate knowledge of the problems are certain that only close integration is feasible. Certainly a more ready exchange between the three medical services, which would operate more effectively than the wartime arrangement, should be initiated and maintained by whatever devices can be arranged. Joint use of hospital facilities where economical and feasible, continued use of joint supply systems, frequent exchange of medical personnel, exchange of liaison officers at administrative levels, joint service committees in all spheres of activity — all of these devices should be developed and encouraged to function for the mutual aid and betterment of the services, each of which may have men serving on land, at sea, and in the air.

In the development of a completely new medical service for the R.C.A.F., tradition had little to contribute and innovations were the order of the day. Despite mistakes and shortcomings which are evident in retrospect the medical branch was established on sound lines and its efforts on behalf of the

airmen, whom it was its privilege to serve, can be contemplated with some satisfaction. The important contribution of the wearers of the winged caduceus to all phases of selection, training, and operations was made evident to the other branches of the force, and it is now axiomatic that medical considerations be given due weight in the complex business of operating a flying service. In the event of a future conflict, with the inevitable necessity of further rapid expansion, it is to be hoped that the experience of the Second World War will provide a firm foundation on which to build.

THE CANADIAN DENTAL CORPS

Canadian Army Dental Corps

In 1915, in Canada, where the standard of dental fitness then exceeded that in some other countries, a free hand had been granted the dental profession to organize and operate a corps on a level parallel to the other army services.

To quote from Sir Andrew Macphail: "This Corps operated as a separate organization and not as a part of the medical corps, although it came under the medical service for administration in the field".*

At the close of the First World War, the perpetuation of the Canadian Army Dental Corps had been assured. An order promulgated, in December 1917, by the Minister of Militia, General Mewburn, had established it in the Active Force on a basis similar to other units. Legislation granting all who served in the war the right to be demobilized dentally fit had imposed an assignment of some magnitude upon the dental profession and the auspices of the Canadian Army Dental Corps were recognized as best qualified to meet the new requirements. The Militia Order upon which its survival depended was never implemented. Numerous unsuccessful attempts were made to revive it. On 15 June 1921, in response to the insistence of the dental profession, the issue of General Order 182 gave proof of a capable effort by the authorities in its behalf and should have given the Corps "a fine start under new conditions". Dissension within the dental profession at the time caused the Director to resign, and as a successor was never appointed, the progress that had then been made was never followed up.

The first evidence of final achievement appeared in the Defence Lists published in 1938. Here, the Non-Permanent Active Militia establishments of the Royal Canadian Army Medical Corps that had been authorized in August 1935 showed the vacancies provided in certain formations for attached personnel filled for the first time in many years with officers of the Canadian Army Dental Corps. The negotiations between the Military Committee of the Canadian Dental Association and the Minister of National Defence that had brought about this change were effective in the introduction of plans for a completely new organization for dentistry in defence. The first official move in this direction is recorded in an order, effective 30 August 1939, that authorized the entire disbandment of the old corps, the Canadian Army Dental Corps; another order was issued effective the following day

* Macphail, Sir Andrew, *Official History of the Canadian Forces in the Great War, 1914-19, The Medical Services*, p. 140.

authorizing the inauguration of a successor, the entirely new military formation, the Canadian Dental Corps.* In consequence of this the infant growth and development of the corps was attended by the good offices of the Royal Canadian Army Medical Corps, and in matters of the general health of the troops the Chief Dental Officer remained accountable to the Army's Director General of Medical Services. The Canadian Dental Corps was designed initially to serve the Army, Navy, and Air Force. In its first efforts to cover this assignment, the Canadian Dental Corps experienced certain handicaps because of its bond with the army medical corps. From the plans it formulated for a dental service for the Royal Canadian Navy, for instance, it discovered itself immediately confronted by a conflict of rights. The Royal Canadian Navy already had a separate medical service and as a national defence formation equivalent yet distinct in its operation from the Royal Canadian Army Medical Corps, the question of prior authority for the Canadian Dental Corps was inevitably introduced.

To add further difficulties to the complexity of this situation, rumours were insistent of the early establishment in National Defence of yet another separate medical service, this time for the Air Force. The autonomy of three independent medical services emphasized the impracticability of the arrangement that had placed the Dental Corps under the jurisdiction of the Royal Canadian Army Medical Corps when it was intended from the outset that it should serve the Navy and Air Force as well as the Army.

The situation was one that compelled attention and by the end of 1938, the senior C.D.C. appointment with responsibility for the inauguration, organization, and administration of the conjoint dental service was redesignated from the initial Chief Dental Officer, to that of Director of Dental Services, with the rank of colonel and a channel of authority directly to the Adjutant General. Doctor F. M. Lott, of the department of prosthetic dentistry in the University of Toronto, was the first director and continued for the duration of hostilities. Early in 1944 the position was again redesignated; the director was now known as the Director General of Dental Services and his rank was raised to that of brigadier.

The establishment of an independent dental service to provide dental care for all three armed forces was a unique development and was the first of its kind in the world. To this innovation the Canadian Dental Corps made further additions. These related to the tri-partite nature of its activities, the mobility of its field service, and the advanced design of its portable equipment.

Mobilization

The Canadian Dental Corps was called out for duty on the second day of its existence in anticipation of the Second World War. The calling out of the new corps on 1 September may have been related to memories of

* General Orders 148 and 149, 7 September 1939.

experience in the First World War; in 1915 a high proportion of rejections for dental defects among volunteers had led to the formation of the Canadian Army Dental Corps; it is probable that this stimulated the prompt mobilization of a dental service for the Second World War.

The new corps was organized on army lines and its personnel wore army uniform, but dental service was provided to all three services in all theatres of operation. The Director of Dental Services maintained his primary channel of responsibility to the Adjutant General in the operation of the army dental services; he combined with it similar relations established for him with the Vice-Chief of Naval Staff, R.C.N., and the Air Member for Personnel, R.C.A.F.

Some obstacles were encountered at first. At one stage, strong opposition was expressed to the army uniform of the dental officers, especially by the R.C.A.F. These objections were not long sustained. The evidence of the efficiency and economy demonstrated by a single and unified command soon became so convincing, and the general satisfaction with the arrangement so readily inspired goodwill, that the case for separation was finally exhausted and dropped. Ever since, the dental requirement of all arms of Canada's defence forces has remained vested firmly as it first began, the care of one formation, the Canadian Dental Corps.

The coastal concentration of Army, Navy, and Air Force, which accompanied seaboard defence mobilization, added heavily to the duties of the C.D.C. in the maritime districts. Here, from the outbreak of war, the serving men of many nations as well as our own came regularly for dental treatment and received sympathetic attention in the dental clinics of the C.D.C.

District Organization

The local dental arrangements of the C.D.C. relating to its organization, administration, and supply in the districts, followed a pattern similar to that of other corps, principally the R.C.A.M.C., and conformed in general with the organization for mobilization planned in the revised Defence Scheme No. 3. A district officer commanding (D.O.C.) in consequence had the authority to set up a dental service in each of the military districts. His was the responsibility for the appointment of a district dental officer to act as his dental adviser, who, in addition to the duties of this office, would establish for his district a dental unit or company. This company was an entirely new formation in military organization. The initial purpose of the C.D.C. in the introduction of such a novelty was to resolve local dental treatment problems. The failure to do so in the First World War had been responsible for the frustration of the plans of the C.A.D.C. to afford the troops in the field the full benefits of dental care. The district company in its structure followed a pattern originated at N.D.H.Q. to meet the needs of the service.

The distribution of such independent dental administration over Canada as the district dental companies now achieved enabled the C.D.C., even

while the headquarters of its chief officer at N.D.H.Q. was being established, to provide all benefits of its service simultaneously and equably in all localities. It was also possible by this means to know where dental manpower was in excess of the requirement and to organize and dispose of personnel to meet the shortages elsewhere.

At the outbreak of the war a dental company was being organized in every district. These companies were composed bilaterally. Each had a headquarters element that included its administrative and stores sections, and a specific number of detachments for clinical or treatment purposes. The number of dental detachments in each dental company was synchronized with the variable nature of the concentration of the troops in the district it served. The basis upon which this was calculated was a detachment to every 500 men. In this way the number of detachments in each company at all times bore that fixed relationship intended for it to the size of the force that was raised or stationed in any locality. The local growth of the C.D.C. for this reason was subjected constantly to careful regulation. This ratio of dentistry to army that had been adopted by the C.D.C. was one that the C.A.D.C. had determined in the First World War, and subsequently, by its experience in the practical application of it, proven to be acceptable as a suitable scale for both organization and expansion. Further support for these views of the C.A.D.C. was added in January 1938, when the United States Army Dental Corps Bill was passed authorizing a dental service for U.S. troops upon the identical basis of one dentist to 500 ranks.

The clinical detachments or sub-sections, which composed the treatment sections of the companies, were made up as follows: each had an operative dental officer (captain or major); a dental assistant (sergeant); and an orderly (private). Furthermore, to attend to the laboratory procedures, additional strength for every two detachments was afforded through the provision of one dental technician (sergeant). The lack of pre-war training and the absence of opportunities for it were most felt by the C.D.C. in the task of filling its trade group vacancies. The dental nurse, for instance, who in civilian circumstances is the counterpart of the C.D.C. dental assistant, was of no help to the service. Arrangements existed at the outset of the war solely for the employment of males in this trade group and no provision could be made at that time, unfortunately, for the employment of female dental assistants; some of these were made available when their employers entered the corps and they would have provided a ready source of trained technical personnel. Dental technicians were also in short supply, and much attention had to be devoted to the recruitment and training of technical personnel.

During mobilization there was the natural increase in demands for treatment and the need for essential documentation. Constant attention was required to meet the needs of a force which grew rapidly in the first month of its existence from 4000 to 57,000; accurate prediction was impossible since the final nature of the Canadian forces had not yet been determined.

While at first the number of dental detachments in the district companies had been regulated by the volume of local recruiting, the tables soon turned as in 1915 and recruiting itself for a time became dependent upon the capacity of the dental services to deal with recruits and fit them for service. The necessity to lower entrance barriers became evident from the start. The dental standards were the first to go and it was hastily agreed that except for gross dental defects and deformities of the jaws, the oral state of a recruit should not bar him from enlistment. In the recruiting centres, the original standards of dental fitness were discarded. A complete survey had to be made now by the C.D.C. of the dental condition within all units as their ranks filled up.

Basic Unit

The success of the C.D.C.'s new basic unit, the dental company, was quickly established and it soon became evident that with only slight variation establishments modelled after it would meet all other conditions of C.D.C. service both at home and abroad. As time passed the sure and equable extension of dental care throughout all Canadian forces was due in no small measure to the formation of these dental units and the skill that was developed in their distribution. Such structural variations as existed between all units of the C.D.C. arose from differences in their employment. It was possible to divide the dental companies broadly into two categories. The first of these, the static unit, is exemplified by the district dental company and its overseas counterpart, the base dental company. Its four main functions were recruiting, training, reinforcement, and the provision of a static treatment service. A fair degree of expansion and contraction was essential to this unit that it might function properly. It retained in its structural formation much of the elasticity of the original unit conception. The second type of dental unit was the divisional or field company but its structure was fixed. The main purpose of the divisional or field dental company was to keep abreast of the movements of troops, principally in the field where ease of transfer and manoeuvrability were requisites of paramount importance. It was the intention of the C.D.C. that troops everywhere in the field should be accompanied by a dental service, and, to ensure mobility, the clinical strength of a field dental company was designed to permit no variation. It had a fixed establishment of a headquarters element of three officers, one laboratory officer, and five clinical sections each of four treatment detachments or sub-sections, a total in all of 24 officers. The district dental companies at home and, at a later stage, the base dental companies when they had been organized overseas, served the C.D.C. not only as depot treatment forces but also as manning pools from which to draw personnel in the initial formation of the overseas divisional or field dental companies and in their subsequent reinforcement.

Apart from a headquarters staff similar to that of the field companies, the strengths of the base dental companies varied in treatment detachments from 11 to 67.

Royal Canadian Air Force

The impact of the responsibility of the C.D.C. to the R.C.A.F. was first seriously felt in Military District No. 2, with the inauguration of the British Commonwealth Air Training Plan in December 1939. The first action in meeting its needs was the appointment of a command dental officer in the district to relieve its D.D.O. of the responsibility for this organization for the R.C.A.F. There followed subsequently other staff appointments that had to be made to organize and administer the R.C.A.F. dental services. One officer served in this capacity throughout the war and saw the post upgraded from Senior Officer of the Dental Service (Air) to Deputy Director of Dental Services (Air) with the rank of colonel. He was assisted in his administration overseas by an Assistant Director of Dental Services (Air), and across Canada by six command dental officers (see charts at end of chapter).

The terms of the reciprocal pact under which the British Commonwealth Air Training Plan worked proved for a time an impediment to the ambitions of the C.D.C., and prevented it from extending to all serving in the R.C.A.F. overseas the complete dental service that had been planned for them. These obstacles to its service were the subject of much negotiation until 1943 when they were resolved and dentistry for the R.C.A.F., even throughout its widely scattered members, matched, in every way, anything contemporary in the Canadian Army and Navy.

Royal Canadian Navy

Expansion in the R.C.N. was less spectacular. The process was steadier, and pre-war arrangements for dental treatment furthermore did exist for naval personnel that could be extended by the corps to great advantage. The civilian dentists engaged in this service associated themselves willingly with the district companies of the C.D.C. and conjoined their efforts with those of the district dental officers making a combination that sufficed to meet the dental needs of the Navy throughout the opening phase of the war. Subsequently, the general influence of expansion in the defence forces was felt in the R.C.N., and the C.D.C. provided for the growth in the Navy that followed through a revision in its arrangements for its dental care. New staff appointments had to be made to reorganize and administer the service and ensure its operation as a distinct and independent department within the headquarters of the C.D.C. One officer served in this capacity throughout the war and saw the appointment upgraded to Deputy Director of Dental Services (Navy) with the rank of colonel.

Canadian Army Overseas

The prolonged inactivity of the Canadians in England afforded the C.D.C. invaluable opportunities for comprehensive treatment in an endeavour to send all Canadians into action without dental defects.

Overseas Command

The initial overseas command in the C.D.C. included the 1st Division Dental Company, the eight dental detachments with formations of the R.C.A.M.C. and one with the 101 A.C. Squadron R.C.A.F. Responsibility was limited to these 27 detachments until June 1940 when the overseas need for dentistry exceeded the resources of such a small force and reinforcements were sent. When a second divisional dental company arrived in the United Kingdom it was accompanied by an additional dental unit, the intermediate overseas base a combination advance model of the eventual overseas headquarters of the C.D.C. and a base dental company. Later the same year when a dental element at C.M.H.Q. replaced the intermediate overseas base, C.D.C., the first Assistant Director of Dental Services in the Corps was appointed. He was responsible for the administration of the Corps in the United Kingdom. In December 1942 this position was redesignated and became the Deputy Director of Dental Services.

Meanwhile, two further new appointments had been created. In May 1942 an A.D.D.S. (Army) was appointed to assume the administration of the field dental companies, and in September of the same year the Canadian Reinforcement Depot at Aldershot was provided with an A.D.D.S., C.R.U.

In 1943, when the Canadians in the United Kingdom divided their forces and certain formations moved into action in North Africa and Italy, the creation of another senior dental appointment for the field became a necessity. This was designated Assistant Director of Dental Services, 1st Echelon. In 1944 an A.D.D.S. was provided for the 21st Army Group in the invasion of North-West Europe.

Stores

The successful operation of a dental service depends on many things but nothing is more important than the quality, quantity, and distribution of its stores. The common lack of preparedness that prevailed in the earliest days of the war, combined with the extreme urgency of every need, produced a universal shortage of all things necessary to mobilization. At first the C.D.C. suffered with the rest from the handicap of scarcity and was forced for a time to conduct its ministrations in the district companies through the facilities of borrowed instruments, loaned surgery accommodation and equipment, and other civilian contributions (notably the services of the prosthetic laboratories). Dental supplies in Canada always had been largely imported and such sources

as the United Kingdom, Central Europe, and even the United States were almost immediately closed to the Canadian dealers creating an impasse that was indeed critical.

In spite of all obstacles, the C.D.C. finally developed its stores; even the first dental officer overseas who went with No. 9 Canadian Field Ambulance, R.C.A.M.C., was fully equipped.

Field kits that had to be originated were soon made available for all treatment purposes. The detachment officer, the dental radiologist, and the dental technician each received kits of equipment and supplies suitable to his several duties. All kits though new in conception and design were soundly developed; they have since weathered every test in the field from the tropics to the Arctic. All field kits were issued in sturdy fibre travelling cases suitably lettered for easy identification. Each dental officer in a treatment detachment received his field operating kit in two small ruggedly built steamer trunks of 33" x 20" x 12". One, marked "A", had interior fitments that transformed it into a portable modification of a regular dental cabinet. A folding metal table was contained inside the lid of this trunk and provided a suitable pedestal upon which to mount the cabinet in a convenient operating position. The "A" kit, as it was called, held the operating instruments, dental materials, and drugs; when used in conjunction with the contents of another trunk of similar size, marked "B", containing the field operating chair, light, heater, engine, and bracket table, it provided the essential equipment for a complete dental surgery.

The dental radiologist had his own trunks. One of them, marked "F", was 37" x 23" x 14", and contained a special x-ray machine with tools for mounting it, and was intended for use in conjunction with another, marked "C", of 33" X 20" x 19" that held, in addition to a complete portable dark room, the essential outfit for processing x-ray films and all essential spare parts for the x-ray machine.

The dental technician also received two trunks. These were marked C and "D" and measured 33" x 20" x 19"; they contained in their lids two folding laboratory tables to form a bench, and in the drawers and compartments there was casting and soldering equipment for metal work together with all the articles commonly used in the fabrication and repair of dentures and appliances.

As all kits were of original design, their early production suffered from the usual unavoidable handicap of trial and error development. For a start, stock products approximating C.D.C. specifications were secured from the manufacturers. Then, by a process of modification and amplification, suitable prototypes were developed and supplied to the industry to assist them in production. In the matter of packaging, much consideration was given, in the selection of the containers for the kits, to modern trends in luggage manufacture; and, similarly, concepts on design and the fabrication of metal

items such as the field chairs, tables, and portable dark rooms were influenced by the current developments that had been exhibited in the application of tubular steel to modern furniture construction.

Quite apart from the local arrangements through the dental company quartermasters for ensuring a steady supply of stores to the detachments, the need for a master stores organization was soon evident. This was met finally through the creation of what became known as depots of dental stores and by their location strategically, at home and abroad. A suitable reserve of dental equipment and supplies was built up by this means, which was constantly maintained at a safe level.

Mobile Dental Service

As experience accumulated and the likely nature and magnitude of Canada's part in the war could be estimated, there was a growing conviction of the need for increased mobility. A special treatment vehicle was visualized as the eventual solution. After a survey of relevant information a suitable vehicle was planned. A special dental van was mounted on the standard 3-ton ordnance truck, and adequate supplies of this vehicle were made available to all units in the United Kingdom. Maintenance of these vehicles was provided by training a member of the detachment, so that the unit was quite self-sufficient. Experience with these mobile units in the field demonstrated their usefulness and importance; some of the special features are the following: a gasoline generator that could be moved and mounted outside the vehicle was furnished to supply the electricity required for light, heat, and power; a water system was installed to ensure a plentiful, usable supply in all conditions; the equipment provided for heating and ventilating the van gave its occupants practically all the best features of air-conditioning. Added to this, the efficiency of the insulation of the body construction, the provision of black-out and fly-screening, completed the preparation of the vehicle for service on all fronts and under every conceivable service condition. This combination of advantages contributed naturally to the efficiency of the C.D.C. field service and the self-sufficiency of the clinical detachments. Dental officers were now in possession of their own vehicles with their equipment stowed in them in a way that made it at all times readily accessible for their use. As the war closed the number of mobile units reached the neighbourhood of 250.

Documentation

Dental officers had to devote time to paper work which they would have preferred to spend on treatment. Documentation was considered essential, and the problem was augmented when dental admission standards were lowered, making a complete review of enlisted personnel necessary. It was recorded with evident relief before the 1st Division left for overseas that the



NO. 2 TECHNICAL TRAINING CENTRE, UTRECHT, HOLLAND, 1945.
Dental officers are seen here receiving instruction at one of the C.D.C. schools where recent advances in dentistry, such as the introduction of acrylics in restorative procedures, were explained. The schools helped to standardize treatment methods.

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documentation had been finally completed. The dental examination and treatment record completed by the dental officers served a number of purposes. Their value may be judged by reference to the following definitions: (a) treatment guidance to preserve its continuity; (b) follow-up material for statistical and veterans' records; (c) surveys for the benefit of research; and (d) posthumous identification of casualties. The forms, charts, and other stationery that formed an essential part in these duties, did not exist at the outbreak of war. Within a very brief space after mobilization, they were originated and a satisfactory distribution was achieved.

Military Training

In the first year of the war, personnel of the district dental companies were subjected periodically to a process of screening and posting. Although by this means the concentration areas were often deprived of their best operators, the constant need of dental officers for the formation of divisional or field dental companies permitted no alternative. In spite of such disruptions, work in the districts was sustained to the limit of their resources so that they kept abreast of all demands for the documentation and treatment of thousands of recruits to meet a reasonable dental standard. In their efforts to make those on draft for overseas dentally fit, military training for personnel of the C.D.C. suffered materially and frequently had to be indefinitely postponed. This was to the great disadvantage of officers and other ranks alike.

Technical Training

Early technical training in the corps followed purely a rudimentary local arrangement. Eventually when the time and suitable facilities for instruction were secured, regular training was inaugurated and rapid progress was shown in this respect through C.D.C. courses and corps technical schools set up both in the United Kingdom and on the continent. At home, the establishment in the Wesleyan College, Spadina Road, Toronto, of an institution, called the C.D.C. Technical Training Centre, provided a wide range of courses. Most of them ran concurrently and were arranged for the instruction of dental officers, dental storemen, dental assistants, and dental technicians. Trades tests based upon the instruction given to dental tradesmen here were held periodically and the standing attained in them formed a basis upon which the special trades pay was awarded.

Women's Services

The entrance of women into the services made a valuable contribution to the dental corps. Members of all three women's services were mustered as dental assistants, clerks in the orderly rooms, and in the dental stores.

Jaw Surgery

The work of the C.D.C. in the management of certain jaw casualties deserves mention. This is a field of surgery that broadens predominantly in the course of war, but in peacetime is too small to afford extensive experience. Although the essential procedures in the care of many of the injuries in this class are readily integrated into the regular practice of dentistry, few dentists have much opportunity to become proficient in it.

Apart from the C.D.C.'s selection and appointment of a few of its specially trained dental personnel to the principal Canadian jaw injury centre at Basingstoke, all dental officers likely at any time to serve in the field received comprehensive instruction in at least the early care of the jaw wounded. This training was carried out through a series of courses held for the purpose in the Basingstoke Neurological and Plastic Surgery Hospital, R.C.A.M.C. Through the attendance there of officers of the C.D.C. either for training or posting to serve in its dental department, this hospital became well known to all dental officers overseas. The activities of the C.D.C. within this hospital enjoyed the sympathetic sponsorship and willing support of the entire staff. This was a real necessity in this work both in the inauguration and development of the dental department, and the C.D.C. owes its gratitude not only to all at this hospital but to those at C.M.H.Q. on the Medical Directorate, to the D.M.S., and the consultant in surgery, under whose immediate supervision this hospital operated, for the encouragement and assistance they gave this project. Quite apart from a general appreciation of the goodwill of the unit, there were certain contributions to the instruction of the Dental School by the specialists of the hospital that deserve special acknowledgement: to the senior neurosurgeon for lectures on "The significance and identification in field first aid of basal skull fractures"; to the senior plastic surgeon for instruction in the "Essentials in the preparation of maxillary wounds in anticipation of Plastic Surgery"; to the hospital radiologist for a course in "The interpretation of regular cranial roentgenograms"; and to the senior anaesthetist (plastic surgery division) for lectures on "Shock, peculiarities in anaesthetizing jaw wounded, and the value and use of an airway".

Growth

The development of the dental service overseas that began modestly in the 1st Canadian Division, through the efforts of the 21 officers and 62 other ranks of the 1st Divisional Dental Company, continued throughout the war until the number serving abroad in the eight field and nine base dental companies of the C.D.C. finally rose to a total of 748 officers and 1748 other ranks. At home, too, the expansion of the corps was phenomenal and from its original N.D.H.Q. headquarters of four officers, (a chief dental officer, his adjutant, quartermaster, and records officer), and such N.P.A.M.

officers as were serving in the district with medical formations, it became transformed in less than five years into the imposing organization described on the accompanying charts.

Recognition

The C.D.C. had shared the fortunes of all three of Canada's defence arms in all theatres throughout the war. All ranks totalled 5287 and had participated actively ashore and afloat in every operation of the C.A.S.F., the R.C.N., and the R.C.A.F. Its record of industry and devotion to national duty received royal recognition in February 1947 when His Majesty, King George VI, bestowed upon the corps its present title, the Royal Canadian Dental Corps.

Prepared by the Directorate of Dental Services

DIRECTORATE CANADIAN DENTAL CORPS

N.D.H.Q. 7 FEBRUARY 1945

D.G.D.S.
[BRIGADIER]

D.D.G.D.S.
[COLONEL]

D.D.D.S.
[NAVY]
[COLONEL]

D.D.D.S.
[AIR]
[COLONEL]

DENT 2
A.D.D.S.
[LIEUTENANT-COLONEL]
TECHNICAL
TRAINING

DENT 4
A.D.D.S.
[LIEUTENANT-COLONEL]
TREATMENT
LABORATORIES

DENT 6
A.D.D.S.
[LIEUTENANT-COLONEL]
RESEARCH

DENT 8
A.D.D.S.
[LIEUTENANT-COLONEL]
LIAISON
DEPARTMENT OF
VETERANS AFFAIRS

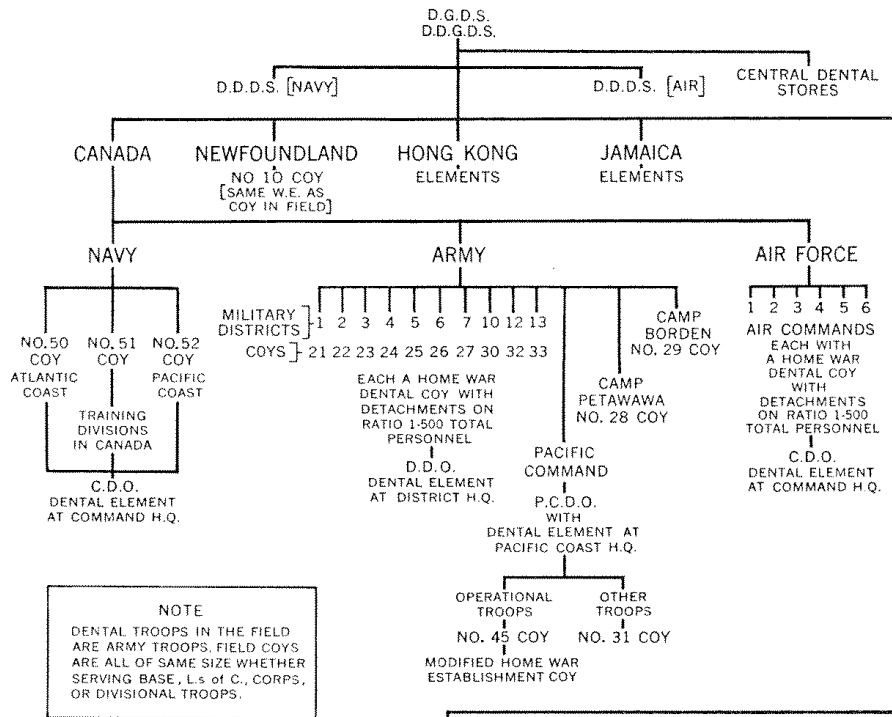
DENT 1
A.D.D.S.
[LIEUTENANT-COLONEL]
ORGANIZATION AND
ADMINISTRATION

DENT 3
A.D.D.S.
[LIEUTENANT-COLONEL]
STORES

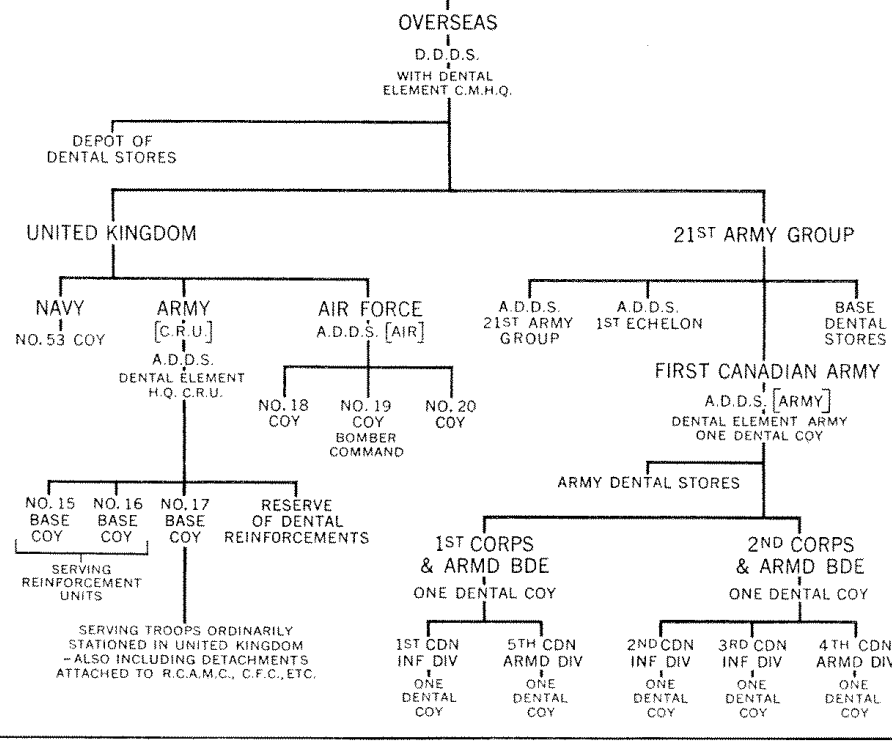
DENT 5
D.A.D.D.S.
[MAJOR]
CLINIC AND
ACCOMMODATION

DENT 7
A.D.D.S.
[LIEUTENANT-COLONEL]
INSPECTIONS

TRI-SERVICE ORGANIZATION CANADIAN DENTAL CORPS
CANADA AND OVERSEAS - 31 MARCH 1945



NOTE
DENTAL TROOPS IN THE FIELD ARE ARMY TROOPS. FIELD COYS ARE ALL OF SAME SIZE WHETHER SERVING BASE, L.s of C., CORPS, OR DIVISIONAL TROOPS.



MANPOWER AND THE MEDICAL SERVICES

The distribution and utilization of the limited manpower as between the armed forces, industry, and agriculture has always been a problem in Canada in time of war. The medical services of the armed forces are indirectly concerned with this vital problem. To accept or retain in the service any individual who is militarily unfit serves no useful purpose and may deprive industry or agriculture of a useful employee. Of more immediate concern to the medical services is the conservation of manpower within our armed forces. Preventive health measures, restorative therapy, and sound rehabilitation are weapons that keep the armed force at its peak strength and efficiency.

During the early years of the First World War military service was voluntary. The medical examination of recruits was largely the responsibility of the unit medical officer with some assistance from local medical boards consisting of civilian doctors. This arrangement did not prove successful and was abolished in 1915. It was replaced by a medical board for each recruiting area. The president was an army officer and its members were civilian doctors of special experience. Another type of medical board, the Standing Medical Board, came into being about that time. They were set up at all stations where reinforcement drafts were being furnished for service abroad. It was the duty of these standing medical boards to examine all men who were reported by their unit as unfit for service abroad and to classify them as: fit for such service; temporarily unfit; fit for home service only; or unfit for any service. In July 1915 travelling medical boards, composed of two medical officers of senior rank and a combatant officer, also of high rank, were established to control the large number of men returned as unfit for duty.

Early in 1917 recruiting had fallen to such a low level that it was necessary for the Canadian government to adopt some form of compulsory military service. As a result, the Military Service Act was passed on 28 August 1917. This act was carried into effect by the Military Service Regulations. It was administered by the Minister of Justice with registrars appointed for each province and a deputy registrar for each military district where there was more than one district in the province. There were also local tribunals of two members whose duty was to deal with applications for exemption. They did not follow any territorial pattern but were set up as the demand arose. The local tribunals of the First World War generally resembled in function the National War Services Board and the National Selective Service Mobilization Board of the Second World War.

Mobilization problems, including the medical examination of recruits during the first four months of the Second World War, have been discussed

In Chapters 2 and 3. Recruiting figures for the early stages of the war, the National Resources Mobilization Act, 1940, the changes in medical categories, the Pulhems system of medical grading and the Army Reception Centres have yet to be discussed.

EARLY RECRUITING FIGURES

On 1 September 1939 the Canadian government authorized the organization of a Canadian Active Service Force which comprised the Mobile Force, the Permanent Force, various headquarters staffs, and the units forming the coastal garrison or acting as guards at vulnerable points. On this date the Permanent Force had a total strength of 4492 all ranks. By the end of the month the total number mobilized was 57,868 and by 31 December this number had increased to 68,913. It was up to 79,822 on 28 February 1940, after "isolated units were formed and personnel absorbed into establishment as policy demanded". The training centres were opened on 15 January 1940 and the first quota ordered in for training was 4728.

Recruiting was reopened for tradesmen of the 2nd Division on 18 February and by the 31st of March the total enlistments for the C.A.S.F. was 84,929. On the same day, general recruiting was resumed for the 2nd Division bringing the total enlistments on 31 May to 96,939, of which the 1st Division and certain ancillary troops, totalling 35,731, were overseas.

On 24 May 1940, the Minister of National Defence announced that the 3rd Division had just been authorized; the 4th Division was authorized on 1 June 1940. The Minister also mentioned that recruiting had to be intensified and that 40,000 men were needed. This general call was made in July 1940 although the number of enlistments for the months of June and July were the highest of any month since September 1939. There were 30,586 recruits taken into the C.A.S.F. in June 1940 and 30,486 in July. By 31 July 1940 the number of troops recruited totalled the impressive figure of 158,011 all ranks. By the end of the year the number recruited was 197,253 all ranks. This figure is not the total strength of the Canadian Army at that time since it does not take into consideration the number of retirements and discharges for medical or other reasons. The number discharged for medical reasons up to that time was 13,393; these figures give some indication of the volume of medical work done by the R.C.A.M.C.

MEDICAL EXAMINATION ON MOBILIZATION

On the receipt of mobilization orders by the D.Os.C. on 1 September 1939 steps were immediately taken to put into effect previously prepared plans. There was apparently little difficulty and all districts were able to set up sufficient medical boards which functioned well within the two-or three- day limit originally set. There is no record available to show the number

of medical boards that were set up across Canada at any one period but the war diaries of No. 2 Military District reported 15 medical boards functioning on 2 September 1939 and on this day 330 recruits were examined. In M.D. 4 the boarding of recruits began on 4 and 5 September 1939. Although there is no available data on the number of recruits examined in this district in these early days, the Montreal Standard on 30 September 1939 stated that one medical board examined approximately 250 recruits in one week.

The 15 medical boards in M.D. 2 had by the 4th day examined 1734 recruits. Of this number 1364 were category A; 47 were category B; 33 were category C; 39 were category D; and 86 were category E, making a total of 1569. (The difference between numbers examined and the numbers allotted categories A, B, C, D, and E, is due to the fact that some were rejected without being given any category.) Of the 86 given category E, 27 had loss of fingers, 17 varicocoeles, 5 defects of nose, 4 defective feet, 4 defective lungs, 3 heart, 3 throat, 4 over age, 2 duodenal ulcers, 2 under age, 1 each for neurotic, rheumatic, adhesions, hydrocoele, diabetes, hernia, and underweight. The following table gives the number examined and the category assigned during the following seven days :

| Date | Number Examined | Categories | | | | |
|-----------------|-----------------|------------|-----|-----|-----|-----|
| | | A | B | C | D | E |
| 6 Sep 39 | 816 | 538 | — | 54 | 49 | 115 |
| 1 Sep 39 | 694 | 454 | 55 | 37 | 57 | 86 |
| 9 Sep 39 | 697 | 444 | 56 | 20 | 65 | 111 |
| 10 Sep 39 | 394 | 261 | 30 | 15 | 33 | 53 |
| 11 Sep 39 | 770 | 625 | 56 | 20 | 72 | 95 |
| 12 Sep 39 | 666 | 453 | 34 | 25 | 53 | 96 |
| 13 Sep 39 | 635 | 460 | 36 | 27 | 43 | 69 |
| TOTALS..... | 4672 | 3235 | 267 | 198 | 372 | 625 |

The total recruiting figures for the first 21 days which was the time allotted for mobilization under Defence Scheme No. 3 were:

| | 1 Div | 2 Div | Anc Tps | CD & AA | TOTAL |
|-----------------------|--------|--------|---------|---------|--------|
| <i>Strength</i> | 14,354 | 15,510 | 10,684 | 9,952 | 50,500 |
| <i>W.E.</i> | 15,542 | 15,542 | 25,574 | 4,753 | 13,411 |

There were also 5656 troops guarding vulnerable points and 4639 troops at district headquarters, district depots, internment camps, and acting as armoury guards.

Local medical boards were set up throughout the district whenever and wherever indicated; these local medical boards and recruiting centres were set up simultaneously and worked together. In less thickly populated areas travelling medical boards were the rule. M.D. 12 had no less than 14 outlying centres to which travelling medical boards were sent. M.D. 13 reports that it had 23 boards functioning throughout the province at the end of the first week.

No major difficulties were reported by any district under this arrangement. The overall planning appeared adequate but many lesser details were completely overlooked and it is attention to those details that makes for efficient medical examinations. In the Ottawa area when the medical boards were assembled, it was reported that the accommodation was inadequate. It consisted of one very large room which was hastily divided into cubicles where the medical officers did their examinations. The building was noisy, and the stethoscope, a delicate instrument designed to pick up faint heart and chest sounds, became the "receiver" of the shuffling of feet and the rumbling of passing traffic. The building was cold and drafty, and the undressed recruits were forced to wait in this depressing atmosphere. Another important complaint of the medical board was the demands from officers commanding units to rush two or three hundred recruits through in a 24-hour period. The flow of recruits to the medical board was by no means constant. This was partly due to the fact that officers commanding could only recruit up to War Establishment and if the rejection rate was high, recruiting had to be reopened. Large drafts brought in from outlying areas could not be accommodated properly or held for any length of time at the depot, thus forcing the boards to work beyond the limit of their efficiency. One medical board examined 90 recruits in one day.

In the Ottawa area after the initial rush was over a standing medical board was arranged which consisted of 10 to 12 N.P.A.M. medical officers who agreed among themselves that they would take alternate weeks, but this was soon found to be unworkable due to the loss of continuity. A strong objection to this procedure was raised by the D.G.M.S. and as a result a more or less constant standing medical board was formed. There was only the minimal amount of interchange of officers on this board.

THE NATIONAL RESOURCES MOBILIZATION ACT, 1940

The deterioration in the European situation and the greater need for additional manpower led the Canadian government to ask Parliament for special emergency powers. These were granted on 21 June 1940 by the enactment of the National Resources Mobilization Act, 1940. The preamble of this Act gives a veiled description of the seriousness of the German threat:

WHEREAS by reason of developments since the outbreak of the present war a special emergency has arisen and the national safety of Canada has become endangered . . .

The special powers were:

The Governor-in-council may do and authorize such acts and things, and make from time to time such orders and regulations, requiring persons to place themselves, their services and their property at the disposal of His Majesty in the right of Canada, as may be deemed necessary or expedient for securing the public safety, the defence of Canada, the maintenance of public order, or the efficient prosecution of the war, or for maintaining supplies or services essential to the life of the community.

This Act provided unlimited authority for the mobilization of manpower for military service, subject at this time to one reservation: men could not be compelled to serve outside of Canadian territory.

To assist in carrying out the purposes of this Act a special government department was created, known as the Department of National War Services. The Minister of this newly-formed department was given authority "to conduct such national registration and make such survey as may be required for the effective carrying out of the provisions of the N.R.M.A. and placing the results of such registration and such survey at the disposal of His Majesty in the right of Canada". The first step actually taken to establish a pool of manpower was the National Registration Regulations, 1940, issued on 12 July 1940 under the authority of the N.R.M.A. 1940. On 7 August 1940 a proclamation was released directing all persons residing in Canada, 16 years of age and over with few exceptions to register in accordance with the above regulations. The National Registration therefore took place on 19, 20, and 21 August 1940.

Having determined the manpower strength of Canada by the above registration, the Governor-in-Council issued by proclamation, the National War Service Regulations, which made every male British subject, resident in Canada between the ages of 16 and 45 inclusive, unmarried or widower without child, liable for compulsory military training. This policy of designating the age classes of men by proclamation was followed throughout the war.

For the purpose of these regulations Canada's 243 electoral districts were divided into 13 administrative divisions with one or more National War Service Boards in each division. The boards consisted of three members, one of whom had to be a judge of a superior or other court of the province in which the larger part of the administrative division was situated. The judge became the chairman of this board and the other two members were representative citizens of the district over which the board adjudicated. The main duties of the board were to investigate and review every application for leave of absence.

The National War Service Regulations also provided in each division a Divisional Registrar who was appointed by the Governor-in-Council. He was the chief administrative officer in the division to which he was appointed. He had a key role to play in the mobilization of Canada's manpower. As he had a duplicate registration card of each designated man in his division, as well as other vital information, he was a central source of information regarding the call-up of the male population. He had the responsibility of selecting, from the pool of designated men in his division, the men who were to be called up from time to time. He had to serve each man with an "Order Medical Examination" and after the medical examination, if the registrar was of the opinion that the man was fit for military training and if the man had no postponement requested or granted, he issued him with an Order

Military Training. It was also the duty of the registrar to keep the Department of National Defence informed of the names, addresses, and serial numbers of the men upon whom he had issued Order Military Training.

MEDICAL EXAMINATION UNDER THE N.R.M.A., 1940

The Minister of National War Services appointed all medical practitioners in Canada in good standing as examining physicians to examine men under the Military Service Regulations. These appointed physicians were provided with a copy of *Physical Standards and Instructions for the Examination of Recruits, 1938* which was the basis of all medical examinations of designated men. The Department of National Defence would from time to time advise the divisional registrar of the number of men required by the Canadian Army on a specific date. The registrar would then select from his pool the required number and issue them with an Order Medical Examination. The registrar had as his adviser a qualified medical practitioner who advised him in matters pertaining to the physical fitness or unfitness of designated men.

The Order Medical Examination specified that the men had to report within a specified time to a duly appointed examining physician of his own choice to undergo a medical examination. The man was also advised at this time that he could file an application for postponement but he had first to undergo his medical examination. He then had to notify his employer. In the early phase of the war travelling expenses to and from the place of medical examination were borne by the individual but in June 1943, P.C. 45/4690 authorized travelling expenses in case of men living in out of the way places where medical facilities were not available and when they could not afford to pay these expenses themselves.

Duly appointed physicians were authorized to examine these men when the latter presented their Order Medical Examination. The medical report together with the Order Medical Examination was forwarded by the physician to the registrar who decided whether the man was fit to be called up or not. If the registrar was of the opinion that the man was unfit he issued a certificate to the effect that the man was medically examined and that as a result of his physical condition he would not be called up for the time being. On the other hand if the registrar was of the opinion that the man was physically fit he issued him with an Order Military Training.

Although the final decision rested with the registrar as to whether the man was fit or not, he based his decision on the medical category shown in the medical report and upon the advice of his medical adviser.

In the beginning and up to 1 July 1944, examining physicians were paid a fee of \$1.00 for each medical examination performed by them in accordance with the military service regulations, but in 1944 the fee was raised to \$3.00.

The above policy remained in effect until 2 September 1943 when a new policy was introduced by P.C. 6990.

Under this new policy designated men were required to comply with the Order Medical Examination by submitting to examinations as follows:

- (a) at the nearest Army Reception Centre, where the designated man resided at a distance from the Reception Centre which permitted a return journey and compliance with an Order Medical Examination all with a duration of forty-eight hours; or
- (b) at the office of a specified civilian examining physician who belonged to a prescribed panel of physicians where the designated man resided at a distance from the office of the specified civilian examining physician which permitted a return journey and compliance with Order Medical Examination all within a duration of forty-eight hours; or
- (c) at the office of any nearest duly appointed civilian examining physician which did not permit a return journey and compliance with an Order Medical Examination within a duration of forty-eight hours.

RE-REGISTRATION

The more urgent need for military manpower and the realization that many men in the designated age classes had not yet been reached in order to be served with an Order Medical Examination led the government to establish a new policy regarding the registration of these men.

There were several reasons why so many of the designated men had not been served with Orders Medical Examination. There were many changes in address from the one shown on the National Registration Card, errors in filling out the duplicate card, and errors in filling out the order. These and the fact that some men did their best to evade the order forced the government to adopt a new policy. This policy was initiated by the Department of National War Services but was put into effect by the Department of Labour when that Department took over the duties of mobilization in December 1942.

The new policy called for the compulsory registration of all men designated by proclamation and who had not been served with an Order Medical Examination. They were to report to the divisional registrar or post office and complete a special form in duplicate which in turn was sent to the divisional registrar. Following the P.C. Order authorizing re-registration, a proclamation was issued giving the age class and date by which the re-registration had to be completed. It was finally completed on 15 March 1943.

Summary of Mobilization

There were only three drafts ever called out under this thirty-day training scheme. They were as follows:

- 1st Draft: From 9 October 40 to 7 November 40
- 2nd Draft: From 22 November 40 to 21 December 40
- 3rd Draft: From 10 January 41 to 8 February 41.

These first three drafts may be summarized as follows:

| | Men Reported | Men Rejected | Men Trained | Percentage Rejected |
|----------------|-----------------|-----------------|----------------|------------------------|
| 1st Draft..... | 27,599 | 2,092 | 25,507 | 7.55 |
| 2nd Draft..... | 30,904 | 2,604 | 28,300 | 8.43 |
| 3rd Draft..... | 30,623 | 2,552 | 28,071 | 8.33 |
| TOTAL..... | 89,126 | 7,248 | 81,878 | 8.11 |

The lowest category acceptable for Order Military Training was C1 and if the trainee were found fit he forthwith became a member of the Non-Permanent Active Militia and was taken on strength of an N.P.A.M. unit. The one-month training scheme had not really begun when discussions on a new plan for increasing the period of compulsory training from one to four months got under way.

These new plans were put into effect on 18 March 1941 by Reserve Army (Special) Regulations 1941. The first four-month training period began on 20 March 1941. There were 4840 trainees of 21 years of age accepted for training in this group. The second draft on 17 April 1941 amounted to 4990 and the third draft 3767 making a total for the first three drafts of 13,598.

The decision to retain N.R.M.A. recruits in the Canadian Army for a longer period was outlined in Appendix to C.A.O. No. 132. It read as follows:

In pursuance of the powers vested in me by Section 8 (f) of Reserve Army (Special) Regulations 1941, as made and established by Order-in-Council P.C. 1910 dated 18 Mar 41, and amendments thereto, I the undersigned, Minister of National Defence, do hereby require all men now undergoing training in pursuance of the said Section 8 (f), and all men who hereafter may be called out for training pursuant to the National Resources Mobilization Act 1940, and who under and by virtue of Section 8 (d) of the said Reserve Army (Special) Regulations, 1941, have become or will become members of the Active Militia, to perform service, duty or additional training on the completion of such training for which they were called out, or on the termination of any postponement of such service, duty or additional training, but only within Canada and the territorial waters thereof and for the period of the duration of the war existing on the 21st day of June 1940, except, when from time to time during such period I may not require them to perform such service, duty or additional training

This new category of trainees were known as "Members (H.D.) of the Canadian Army". The difference that existed between the three distinct groups of this period, namely: (a) an "A" Recruit, (b) an "R" Recruit, and (c) a member (H.D.) of the Canadian Army, may be defined as follows:

(a) An "A" Recruit was a person who had engaged to serve on Active Service during the continuation of the State of War then existing and for the period of demobilization thereafter and who had been taken on the strength of a Corps of the Canadian Militia placed on Active Service pursuant to Section 64 of the Militia Act, and who was undergoing training at a Basic or Advanced Training Centre.

(b) An "R" Recruit was a person who had been called out for training pursuant to the National Resources Mobilization Act 1940. had become a member of the Active Militia on the strength of an appropriate Corps thereof not placed on

Active Service, or in lieu thereof was carried on a General List and who was attached for training to a Training Centre (whether Basic or Advanced) including such a person who had ceased to be so attached for training, was attached to a Training Centre for any period during which he was receiving medical and hospital treatment from or on behalf of the Department of National Defence in respect of any disability having occurred or having had its origin while he had been undergoing training.

(c) A "Member (H.D.) of the Canadian Army" was a person who had been called out for training, service or duty pursuant to the National Resources Mobilization Act, 1940, who had ceased to be attached to a training centre and who had been taken on the strength of an Active Formation or Unit of the Canadian Army to perform service, or duty or additional training, only within Canada and the territorial waters thereof as the Minister might from time to time have required, but not for a longer period than the duration of the state of war existing on the 21st day of June 1940. A Member (H.D.) of the Canadian Army should have ceased to be carried on an N.R.M.A. Clearing Depot.

The next major change in the administration of the N.R.M.A. was on 30 June 1941; recruits called out for the 30-day training scheme were now required to undergo further training, or service on duty for the duration of the war. The first draft under these new regulations was called out on 2 July 1941. It numbered 1300. The four-month training period was still maintained as under the initial regulations until the 18th requisition when there was a change in the administrative policy. Men were now called out daily instead of monthly and they reported to the district depot instead of the basic training centre. This change in policy relieved the load on the basic training centres and it spread the task of documenting and outfitting the "R" recruits over a longer period. This policy was adopted on 12 June 1942.

On 1 August 1942, National Resources Mobilization Act was amended, that clause which prevented any person from being called upon "to serve in the Military, Naval or Air Force outside of Canada and its territorial waters thereof" being removed; the Government's new powers were not utilized until November 1944 when P.C. 8891 authorized the dispatch of "R" recruits overseas.

MOBILIZATION OF WOMEN INTO THE ARMED FORCES

The ever-increasing demand for manpower both in the armed forces and in industry, the desire of the women of Canada to take a more active part in the war, led the government to accept women in the armed forces. Order-in-Council P.C. 4798 of 2 July 1941 authorized the formation of the Royal Canadian Air Force (Women's Division), and Order-in-council P.C. 6289 of 12 August 1941 authorized the formation of the Canadian Women's Army Corps.

The policy adopted as outlined in Circular Memorandum No. 299 dated 12 August 1941 instructed the divisional registrars to issue each

volunteer a special form which was completed and forwarded by the registrar to National Defence Headquarters. From information given in these forms national defence authorities would decide who would go for medical examination. These names were then sent back to the registrar who sent by mail a notice to undergo a medical examination by a duly licensed examining physician in their locality. If the volunteer were found medically fit she was instructed to report for enlistment at an appropriate time and place. The acceptance or rejection by either the Army or Air Force was final. The Department of National War Services had nothing further to do with the volunteer after the acceptance or rejection by the Army or Air Force. This policy was followed until January 1942 when full control was vested in the branch or service where the recruit wished to volunteer.

MEDICAL CATEGORIES

The system of designating the physical fitness of soldiers by categories was brought into being in the latter years of the First World War. On 15 May 1917 a general directive was sent out stating that all warrant officers, N.C.Os., and men serving in Canada in the C.E.F. either recruits on enlistments or serving soldiers would be classified according to categories. Certain changes were made in these standards throughout the intervening years of peace but it was not until 1938 that a pamphlet was issued which gave in detail the actual physical conditions that warranted such and such a category. This pamphlet was known as *Physical Standards and Instructions for Recruits 1938*. It laid down the criteria of physical fitness for the Militia, Navy, and Air Force and was quite adequate for peacetime needs.

It was difficult to judge the suitability of these standards until the extent of Canada's participation in the conflict was fully known. The D.G.M.S. felt that categories lower than "A" might have to be accepted. He pointed this out to the Adjutant General as follows:

What may be decided regarding the method of categorization on mobilization, will, to an extent, be dependent on the decision as to whether mobilization will be voluntary or carried out under some form of national service, the strength of the Force, or Forces, to be mobilized and the length of time they will be maintained.

Should the numbers be large and maintained over a long period, then a time may come when it may be necessary to enroll those in categories lower than "A", that those who are the most fit may be conserved for service which is the most strenuous and those of lower categories utilized for duties which they may perform with the least risk of aggravation of physical conditions which have resulted in lowering the categories.

Should a form of national service be brought into effect, then the numbers of personnel, category "A", may be expected to be greater and the normal proportion of the country in that respect may be known in due course and the supply of such personnel will be estimated.

If a system of voluntary enlistment obtains, the loss of category "A" men will be more general and the enlistment of lower category personnel will become essential for the maintenance of a Force.

There are certain duties on which men of lower categories may be more usefully employed without great loss in efficiency in the service involved and it might be advisable to consider at the time of mobilization, a percentage can be enlisted, thus permitting a more rapid completion of units for which category "A" is indicated.

Physical Standards and Instructions, 1938 laid down that only category "A" recruits would be enlisted in the Permanent and Non-Permanent Active Militia with the proviso that the officer commanding, N.P.A.M. units, might accept category "B" recruits who had previous service.

The general grounds for rejections were:

Indication of tuberculous disease; constitutional syphilis; bronchial or laryngeal disease; palpitation or other disease of the heart; generally impaired constitution; under standard of vision; defects of voice or hearing; pronounced stammering; contraction or deformity of chest or joints; abnormal curvature of spine; defective intelligence; hernia; haemorrhoids; marked varicose veins or varicocele; inveterate cutaneous disease; chronic ulcers; fistula; traces of corporal punishment, or any disease or physical defect calculated to unfit them for the duties of a soldier.

Candidates requiring dental work will be rejected pending completion of such work required to ensure an adequate masticating surface. Candidates presenting abnormalities of shape of the jaws which prevent normal occlusion should be rejected.

A history of the following conditions will be considered a cause of rejection; Rheumatism in young candidates, any form of Tuberculosis, Pleurisy, Nervous or Mental Disorder, Epilepsy, Syphilis, Asthma, recent Enuresis, Gastric or Duodenal Ulcer. When there is an element of doubt as to the physical or mental fitness of a candidate, he will be rejected.

Mental Capacity

Special attention should be given to mental capacity, considered in conjunction with the man's standard of education and his previous occupations and surroundings, in reference to the duties he will be required to perform as a soldier. Defective intelligence is frequently associated with adenoids, nasal obstruction, mouth breathing, evidence of rickets and so-called stigmata of degeneracy. Intelligence should be assessed as alert, average, or dull.

The recruits were classified by categories according to the following scale:

"A" Fit for general service

Men perfectly fit mentally and physically, for all active service conditions of actual warfare in any climate, who are able to march, can see to shoot, and hear well.

"B" Fit for service abroad (but not for general service)

Men free from serious organic defects, able to stand active service conditions on lines of communication; who are able to march at least five miles, see to shoot with glasses and hear well.

"C" Fit for service in Canada only

Men free from serious organic disease, who are able to stand home service conditions and undertake duties chiefly of a sedentary character, able to walk five miles.

"D" Temporarily unfit

"E" Unfit for service in Categories A, B, and C.

The standard for chest measurements was at least 34 inches; that of height was 5'-7" for artillery, and 5' 4" for other arms. Weight of the recruit varied between 138 pounds required for cavalry and 140 pounds for other

arms, P.A.M. The visual standard for Category A was 20/30 (Snellen's Test Type) or better in each eye, with glasses, and no organic disease present; for Categories B and C— not less than 20/40 in each eye, without glasses, and no organic disease present.

The standard of deafness was taken as the inability to hear with either ear at a distance of 20 feet words uttered in a strong whisper. The organic diseases that constituted ground for rejection were perforation of ear-drum, polypus, or granulations and dermatitis of the meatus.

Notwithstanding these high standards the classification of recruits accepted into the C.A.S.F. on mobilization was as follows:

- (a) *Mobile Force Units.* All category "A", subject to the qualification that Category "B" men may be utilized as under,
 - (i) For units employed on the lines of communications and duties at the base.
 - (ii) In all units if employed on sedentary work as clerks, cooks, batmen, orderlies, sanitary duties and storemen.
 - (iii) Skilled tradesmen employed at their trades.
- (b) *Garrisons of Defended Ports.* Categories "A", "B" and "C" subject to the qualification that personnel of infantry units (M.G. or Rifle) will not include category "C" men.
- (c) *Units employed as Guards for Vulnerable Points and Prisoners of War Receiving Stations and Camps.*
Initially categories "A" and "B", ultimately category "C".

It soon became apparent that these standards were much too high and on 14 September 1939 Routine Order No. 5 introduced new categories known as AV, BV, and CV to indicate that the recruit's vision was corrected by glasses. Such individuals were then eligible for enlistment in units in subparas (b) and (c) above but not in units of the mobile force.

Routine Order No. 5 did not relieve the situation to any appreciable extent and was cancelled by R.O. 346 of February 1940, which stated that the visual standard for category A would be as low as 20/40 in better eye and 20/60 in worse eye. Categories B and C would be 20/80 in better eye and 20/120 in worse eye correctable to 20/30 in better eye and 20/40 in worse eye. In special cases (tradesmen, technicians, and clerks) and with the permission of N.D.H.Q. a standard of 20/200 if correctable to 20/30 could be accepted into the Army. Still further significant changes both in the Physical Standard and Classification were introduced in June 1940 by R.O. 543. The categories B and C were divided into B1, B2, C1, and C2 respectively and later by R.O. 1350 in October 1941, the A category was divided into A1 and A2. R.O. 543 further lowered the eye standards by making it possible to recruit men with total loss of vision in one eye provided the other eye was normal. Such cases would be given category C2. The minimal standard for height was lowered to 5 feet, weight to 120 pounds, and chest measurements to 32 inches.

But the visual standards had yet to receive several revisions in order to make more men eligible for enlistment. G.O. 30 of 1942 fully revised the previous standards and did allow a vision as low as 20/400 in either eye provided both eyes could be corrected with glasses to 20/40. This G.O. is not quoted in full here as it was superseded by G.O. 548 of 1944 which further lowered the standard especially in the degree of correction, i.e., the front line fighter need not have better vision than 20/200 corrected with glasses to 20/40 in right eye and 20/80 in left eye. The lowest standard acceptable in the Army was 20/400 in both eyes with only one eye correctable to 20/40.

The standard for hearing as set down by *Physical Standards and Instructions 1938* was the ability to hear words spoken in a strong whisper at 20 feet but in 1940 the standard for category A was reduced to the ability to hear the conversational voice (CV) at 15 feet in each ear or ability to hear the CV at 20 feet in one ear and no hearing in the other. The ability to hear the CV at 15 feet in one ear and with little or no hearing in the other ear was given category B1. If the recruit could only hear the CV at 10 feet in each ear he was given category C1. In 1944 G.O. 548 further reduced the hearing standard to ability to hear the CV 15 feet in one ear and CV 10 feet in the other for the highest graded and the ability to hear the CV at 5 feet in both ears or 10 feet in one ear and total deafness in the other.

There were many other minor reductions in the physical standards — all with the object of maintaining the quota of manpower in the field. Re-medial treatment was introduced in 1940 and this alone enabled many individuals to enlist who would otherwise have been marked unfit. It was mostly confined to such conditions as hernia, varicose veins, and dental conditions. These conditions in 1939 were cause for rejection but men suffering from them were later taken into the Army, had remedial treatment, and were graded A 1.

But the most important change was not in the medical standards of recruits but in the system of categorization and this brought about a new system which is now known as the PULHEMS system of grading. It was introduced by the Royal Canadian Army Medical Corps and accepted by the Canadian Army in 1943.

THE PULHEMS SYSTEM OF MEDICAL GRADING

During 1942 the *Physical Standards and Instructions for Recruits*, as then published, came under severe criticism from nearly all serious minded medical officers and personnel selection officers who had to do with the medical grading and allocation of recruits respectively. The 250 or more jobs in the Army, each calling for its own physical, mental, and emotional standard, according to their specific characters, made it obvious that the functional assets of every soldier should be known in order to allocate him to his task.

The rapid expansion of the Canadian Army put such severe strain on the limited manpower supply that it became increasingly evident that this limited supply had to be used to full advantage in order to maintain a highly complex and technical army in the field. The old standards for medical categorization were primarily based on the requirements of a foot soldier, the criterion of fitness being the ability to march or walk so many miles, and the special senses were grouped in such a manner that it did not allow of finer differentiation of degree of disability or defective function. This perhaps served its purpose when the uses for a soldier were less diverse and specialized. The technical requirements of soldiers were simple and few. With the advent of technical and mechanical warfare the need for greater personnel Selection became apparent. For personnel selection and army examiner to place the round peg in the round hole, the soldier must be physically assessed in detail rather than en masse. They must know the functional capacities of each individual soldier.

It was believed that a description of the individual in functional terms was possible and an accurate appraisal of the strength, stamina, and potential abilities of every recruit could be accurately assessed, and the individual fitted into the army job to which he was best suited.

There was also a humanitarian side in army employment. Every individual is the embodiment of many emotions and it is the harnessing of these emotions that enables an individual to adapt himself to his environment. To change that environment requires from the individual a change in his emotional adjustments. If he is unable to adjust himself to his new environment he is subjected to an emotional conflict within himself which results in a decrease in his efficiencies. It is true that the change from civilian life to army life is a change in environment but if his army life and employment can in any way simulate his civilian life and occupation, the conflict of emotions is lessened and his efficiency is proportionately increased.

Emotional conflict results from many factors other than the mere change in environment. If the individual is employed at the level of his physical, mental, and emotional capacity, neither above nor below, and if his interests, experiences, knowledge, and skills are utilized, and if he is permitted to develop his latent abilities, he then achieves his maximum efficiency.

Having recognized the need for closer supervision of the physical, mental, and emotional capabilities of each soldier in this allocation to employment, the Army introduced the Directorate of Personnel Selection whose members, in close co-operation with the medical services, undertook the job of allotting the soldier to the task for which he was best suited, or, in other words, placing the recruit or soldier in the job where he can do his best with the greatest satisfaction to himself and the Army. This department introduced into the Army the M test, which was one measure of the mental capabilities of each soldier.

About this time the psychiatrists of the medical services introduced the Psychiatric Questionnaire, a test designed to discover as nearly as possible the emotional stability of each recruit; thus two factors were added to the standard type of medical categorization.

The medical services and the Directorate of Personnel Selection had to work in very close co-operation for it was necessary for the army examiners to have full appreciation of the functional capabilities of the individual as outlined by the medical boards. The army examiners were not physicians and could not interpret the medical diagnosis. If the recruit were graded B1 they knew that he should be able to see to shoot or drive; could undergo considerable exertion not involving severe strain; should be "able to march five miles; should have a moderate non-progressive disability". They had no indication of the man's functional abilities and in order to allocate him to suitable employment they had to consult the medical officer who gave the grading.

The first approach towards a revision of the "letter" category system was an attempt to describe in "functional" terms the various kinds of army job. What kind of physical capacities are brought into play in the performance of each job? Which limbs and which senses are required? Which limbs and which senses are not required? In some army duties, such as that of infantryman who carried the load of the 3" mortar into action, physical strength and stamina are a priority. In some duties the faculties of acute hearing or keen eyesight may be pre-eminent while other jobs might be performed by men who are partially deaf or perhaps even partially disabled in certain limbs. In all combatant duties with operational units extreme emotional stability is required while there are other essential military occupations in which a person of nervous energy and sensitive imagination may be most effective. In some instructional duties, physical fitness may be of little importance as compared with intellectual ability.

The problem that arose in the minds of both medical officers and army examiners was how to develop a method by which the medical services could advise the army examiner on the exact functional capabilities of each individual. The obvious answer was to grade the individual under each and every anatomical system but this would be a cumbersome and confusing method. A physical grading to be workable must be simple. It was thought possible to divide the human system into six distinct functional parts, i.e., physique, upper extremities, locomotion, hearing, eyesight, and mentality, using the first letter of each to form a profile and then by using numerical gradings to express the degree of function.

This proposed new scheme of functional categories was discussed at a meeting on 14 January 1943 and it was decided that a sub-committee composed of D.G.M.S., D. Org., and D. Personnel Selection be set up to discuss and report on the new system. The sub-committee reported that the new system was "soundly conceived and should be adopted by the Canadian Army". At this meeting the mental rating was divided into "mental" and "stability" and put under separate headings. The resulting profile, now

composed of seven distinct functional parts arranged for convenience to form the word PULHEMS, was recommended for adoption by the Canadian Army.

The seven factors indicated under the PULHEMS system reveal the physical, mental, and emotional capabilities of the individual as follows:

- P Physique — This includes development, height and weight, his potential capacity acquire physical stamina with training. It is his capacity for work. Under P is included the Cardio Vascular System, Respiratory System, Digestive System, Neurological System (organic), Integumentary System.
- U Upper Extremities. — Functional use of hands, arms, shoulder girdle and upper spine.
- L Lower Extremities. — Functional use of feet, legs, pelvis and lower spine.
- H Ears and Hearing.
- E Eyes and Eyesight.
- M Mental capacity — Intelligence.
- S Stability — Emotional.

There are five grades under each factor, each grade being indicated by figures so that grades 1 to 5 embody the whole range of functional fitness. A grade 1 under all factors indicates that the man is fit for duty in any theatre of operations but a grade 2 indicates that his functional capabilities may be limited if he is subjected to prolonged stress in very difficult circumstances. A grade 3 indicates fitness on a job that does not call for excessive or prolonged strain and where the working and living conditions are favourable. Grade 4 is a home base profile and as a rule indicates that the individual is fit for duties of a light or sedentary nature. Grade 5 is unfit for any type of army duty. The above account of the numerical degree of grading gives a fairly accurate description of the degrees of function.

Such a profile gives very little information concerning the individual's state of health or physical condition but does reveal, factor by factor, his functional capacity. "It is a graph of the soldier's ability to work at set levels of performance".

These levels of performance are outlined in Physical Standards and Instructions issued by the Canadian Army, e.g., the Profile

| Year of Birth | P | U | L | H | E | M | S |
|---------------|---|---|---|---|---|---|---|
| 15 | 1 | 1 | 2 | 1 | 1 | 1 | 4 |

means :

- P 1: Fit for heavy manual work, including digging, lifting, climbing, etc., under conditions of severe and prolonged strain that may be required of a front line fighter.

- U 1: Fit to lift strongly to and above shoulder level; use rifle and bayonet; throw grenades, dig, push or draw strongly; drive heavy vehicles; fit for hand to hand fighting under all conditions.
- L 2: Fit to march 5 miles a day or 20 miles a day if necessary. Able to stand, run, climb, jump and dig; unable to sustain such actions for long periods.
- H 1: Ability to hear sufficiently well to serve in any capacity.
- E 2: Ability to see sufficiently well with glasses to serve in any capacity except front line fighting. Ability to perform duties where slight organic disabilities do not disqualify; dependent on glasses.
- M 1: Ability, under Army conditions, to learn to perform successfully full combatant duties including those required of tradesmen and specialists.
- S 4: Emotionally fit to perform specific Army duties adequately under working and living conditions favourable to the individual.

The PULHEMS system was officially adopted in the Canadian Army by R.O. 3666 effective 1 October 1943 and the tremendous task of changing from the old system to the new began. It was laid down in the above order that the PULHEMS grades would be initially awarded upon enlistment or enrolment by medical boards, the grade under each function being recommended by the appropriate specialist.

Changes from medical category to PULHEMS profile in serving personnel could be done by the unit medical officer if a specialist were not available. The M and S grades would be awarded in consultation with the army examiner. All changes under P/U/L/H/ or E would be done by a medical officer with the approval of the appropriate specialist but changes in the M and S grades could be initiated by either the medical officer or army examiner but the final consent of the psychiatrist was necessary.

There were very few changes in the PULHEMS system following its adoption. This alone gives good indication of the soundness of the system. Few changes in policy of such a revolutionary nature ever took place in army organization with so little opposition and minimal revision. There was some difficulty in assessing the M and S gradings and it was finally decided to use only M1, M2, M4, and M5, to indicate intelligence sufficient for full combatant duty, trade, or specialist training in the case of M1 or intelligence sufficient for non-tradesmen or non-specialist combatant duty in the case of M2. M4 indicated specific defects in intelligence or training ability which prevented the individual from learning full army training. Such an individual would be suitable for simple routine duties. M5 was unsuitable for service in any capacity because of insufficient intelligence. Army examiners could allocate either M1 or M2 but the screening by a psychiatrist was necessary for M4 and M5.

The S factor also underwent some changes especially in the intermediate grading of S2 and S3, and finally both these degrees of stability were dropped except in some theatres where it was found possible to assign such grades and use the personnel so graded in a special employment company. There are many advocates of such a policy especially among leading army psychiatrists.

The PULHEMS system of medical classification of an armed force was wholly a Canadian army project. It was initiated by the R.C.A.M.C. and developed in close co-operation with the Directorate of Personnel Selection. Its advantages over the old method of medical grading were widely recognized and the PULHEMS system has since been adopted with minor modifications by the British, United States, and other armed forces.

ARMY RECEPTION CENTRES

The idea of instituting reception centres to replace the medical recruiting and enlistment boards was first conceived in 1942. The defects in the traditional three-man medical boards at recruiting centres were first appreciated in M.D. 10 and it was there in Winnipeg that the idea of having a single but complete medical board of specialists to examine all recruits was put forward in that district. The success of this adventure came to the notice of the D.G.M.S. who was quick to appreciate its usefulness and the originator was brought to N.D.H.Q. to elaborate his ideas. The original name of these centres was army induction centres, a term borrowed from the U.S. Army but as many of the recruits were volunteers the term induction was thought to be unsuitable and it was changed to army reception centre.

On 15 September 1942 the D.G.M.S. put forward a proposal to the Adjutant General to open a trial reception centre in Military District No. 10 in order to discover in detail the various difficulties and problems that might arise. It was also suggested that the establishment should afford provisions for the employment of medical officers qualified in the following specialties: internal medicine (general); internal medicine (chest); surgery (general); surgery (orthopaedic); eye, ear, nose, and throat; and psychiatry.

Following the D.G.M.S. proposal for a trial reception centre a meeting was held in the Deputy Adjutant-General's office on 17 September 1942. The Deputy Adjutant General in his opening remarks explained that the Minister of National Defence had informed the D.G.M.S. that the present system of "promiscuous and heterogeneous medical boards across Canada should cease", and it was the duty of the meeting to evolve some system under which the medical boards will be connected with the recruiting centres.

The reasons given for the failure of the existing system were:

- (1) That medical boards were too numerous being created whenever the need arose.
There were:
 - (a) Medical Boards at District Depots.
 - (b) Medical Boards at a set location in certain large centres where recruits were examined and then sent to District Depots.
 - (c) Temporary Medical Boards in outlying areas where members met at frequent intervals or on stated days to examine candidates who were then, if medically fit, dispatched to either large centres or to District Depots.
 - (d) Travelling Medical Boards in some areas.
- (2) That medical boards were not doing good work. Some of the boards were composed of civilian practitioners and were not under Army control and in other cases there was too much interchange of doctors, thus losing continuity.

There were some further interesting points brought out at this meeting. The foremost concerned the different regulations governing the recruiting and medical examination of "A" recruits and "R" recruits. "A" recruits were dealt with by the district recruiting officer (D.R.O.) quite independently of the district depot, whereas the "R" recruit following his medical examination by his local doctor reported directly to the district depot and was not required to sit before a medical board. If he were found medically unfit by his local physician he still did not appear before a board but only his medical report came under review. A case was cited where, of 75 men called up under the N.R.M.A. 1940, 49 were rejected as medically unfit and 47 of these were rejected for heart conditions, all by the same doctor.

On 1 October 1942 the Adjutant General instructed the District Officer Commanding M.D. 10 to open a trial reception centre, and on 20 October 1942 the District Officer Commanding M.D. 6, received similar instructions.

The medical officer establishment was to be the same as requested in the D.G.M.S. proposal but the source of the medical officers and their eligibility were outlined as follows :

These specialists will be furnished by the re-posting of Medical Officers (Specialists) from Units of the Active Force, or if none are available from this source, by additional appointments to the Active Force. Employment will be in the acting rank of Major during the period so employed.

To be eligible to carry out the duties as Specialists on a Reception Medical Board the following qualifications are essential:

(1) Professional men of 10 years standing who have one or more of the following qualifications.

- (a) Hospital or Institutional Appointment
- (b) Teaching Appointment
- (c) Post-Graduate Training
- (d) Diploma of Specialty
- (e) F.R.C.P. & S of Canada (Fellow of the Royal College of Physicians and Surgeons of Canada). M.R.C.P., F.R.C.S. of London or Edinburgh (Member of the Royal College of Physicians and Surgeons London or Edinburgh). F.A.C.S., F.A.C.P. (Fellow of American College of Surgeons, and Fellow of American College of Physicians).

Purpose of Army Reception Centres

The purpose of the reception centre was only the enlargement and concentration of facilities for the examination of recruits which had existed from September 1939. The authorization of additional personnel and the use of the term reception centre did not change the functions of the medical boards or the recruiting machinery already set up. It was the intention of the originators of this plan to provide *one central* point in each district where each and every recruit would be examined by groups of specialists, i.e., the medical examination would be done by medical, surgical, orthopaedic specialists, psychological examinations by army examiners, and the recruiting phase would be handled by trained recruiting personnel.

The reception centre made possible the training of a more or less permanent and efficient staff which could be instructed to handle applicants from the applicant's point of view and not from the Army's. It was a streamlined system whereby the recruit could be taken before a recruiting officer for a short interview and then moved along the line to a clerk who recorded certain particulars and gave the recruit the order of his examination, viz., medical examination, personnel selection test and examination, attestation, and general instructions. Every move was precise and impressive.

On 3 December 1942 the Adjutant General sent a directive to all districts stating the formation of reception centres had been approved in principle and the centres were to be at district depots wherever possible.

- (i) He also called attention to the following points:
 - a) It is now proposed to board at the Reception Centres, all N.R.M.A. personnel receiving calls, except certain persons obviously unfit who will be screened out by Selective Service doctors at their home localities.
 - (b) All volunteers will be brought to the Reception Centres for medical boarding.
 - (c) It is proposed to issue all men boarded with a certificate of categorization except those in category E who will be issued rejection certificates.
 - (d) It is proposed to accept "A" and "B" category men.
- (ii) It is estimated that some 50,000 men may have to be examined each month.
 - Estimates broken down into districts are as follows:

| | | | |
|--------|--------|-----------------|------|
| M.D. 1 | 3250 | M.D. 7 | 1750 |
| M.D. 2 | 9000 | M.D. 10 | 4060 |
| M.D. 3 | 3250 | Pacific Command | |
| M.D. 4 | 10,000 | | 3250 |
| M.D. 5 | 5500 | M.D. 12 | 4000 |
| M.D. 6 | 2500 | M.D. 13 | 3500 |
- (iii) Subsistence and transportation in respect to N.R.M.A. personnel, prior to induction into the Army is the problem of the Civil Director of Selective Service. Those who meet Army requirements will be required to report for duty as directed by Civil Director of Selective Service.
- (iv) Question of enlistment leave to wind up business and questions of postponement will arise; in case of active volunteers District Recruiting Officer will recommend, if necessary. In case of N.R.M.A. personnel this will be directed by Director of Selective Service.
- (v) The question of subsistence and transportation in respect to active volunteers, prior to enlistment will be the responsibility of the district officers commanding.
- (vi) Reception Centres, when located at a District Depot, will come under command of the O.C. District Depot. It is envisaged that the senior Medical Officer would supervise medical arrangements and co-ordinate functions of dental, personnel selection and District Recruiting Staffs as they relate to medical examination.
- (vii) Reception Centres, should provide for examination of C.W.A.C. either by arrangement of hours or by organization of Centre.
- (viii) When planning layout, it might be kept in mind that some day these centres may be used as demobilization medical centres. . . .

Most of the military districts were able to put this order into effect almost immediately either by getting accommodation in a wing of the district depot or by requisitioning nearby buildings. The notable exceptions were M.Ds. 4, 5, 7, and 13 in which cases new accommodation had to be erected.

Nevertheless the principles of the reception centres were put into operation under make-shift arrangements and it is safe to say that reception centers were functioning as such across Canada by the middle of 1943.

The most difficult problem was the question of administration. After much discussion it was finally decided that the officer commanding district depot would be in charge of the reception centre.

The authorized establishment of R.C.A.M.C. personnel was:

| | |
|----------|---------------------------------------|
| 1 Lt-Col | President, Medical Board |
| 6 Maj | Specialists |
| 2 Capt | Medical Officers |
| 2 Sgts | Optometrists (Group A) |
| 1 Cpl | Laboratory Technologist (Group B) |
| 1 Cpl | Clerk (Group B) (President's office) |
| 1 Cpl | Custodian of valuables |
| 6 Ptes | Clerks (Group B/C) |
| 3 Ptes | Typists (Group C) (Medical histories) |
| 2 Ptes | X-Ray Clerks (Group C) |
| 3 Ptes | Runners |
| 1 Pte | Towels and showers |
| 2 Ptes | Height and weight |

The adoption of the army reception centre did much to elevate the standard of medical examination. Not only were recruits and serving soldiers medically examined by specialists but the whole medical board was now under the same roof, and it was able to hold clinics on difficult cases and by the interchange of ideas it was possible to allocate the proper category. Furthermore, discussion groups of clinics were held at monthly intervals and the medical officers were able to discuss their difficulties and standardize their methods. These centres also enabled army examiners to get a more concise picture of the medical appraisal of the individual. They took their difficult cases back to the medical specialist and discussed with him in lay terms the soldier's medical disabilities and functional capabilities and were therefore able to make a more exact allocation of the individual to his appropriate task.

The final advantage of these centres was the ease with which they could be reconverted to demobilization centres and this additional function was taken into consideration when the reception centre was first conceived. Little can be said concerning the demobilization boards except that they were reception centres in reverse. The soldier having requested his discharge and having been found eligible on a point system was sent to the district where he elected to take his discharge. Here he received his final army medical examination but now there was no question of fitness or unfitness. He underwent a thorough examination to determine all his disabilities which were meticulously recorded. Rarely was he held for treatment except in the case of communicable diseases but it was explained to him that he was entitled to one year's free medical treatment from the Department of Veterans Affairs.

Having completed his medical examination he was interviewed by army counsellors (personnel selection) who explained to him the facts of rehabilitation, educational opportunities, and the type of occupation that would be best suited to his educational and physical capabilities.

THE CANADIAN MEDICAL PROCUREMENT AND ASSIGNMENT BOARD

The Canadian Medical Procurement and Assignment Board was established in 1942 under the provisions of Order-in-Council P.C. 6185, dated 20 July 1942. At that time it was known as the Canadian Medical Procurement and Assignment Board for Physicians, and on the board were: Director General of Medical Services (Army); Medical Director General (Navy); Director of Medical Services (Air); Director of Medical Services (Department of Pensions and National Health); Medical Director (Department of National War Services); one representative (lay) of the Director of National Selective Service; and five representatives from the Canadian Medical Association, these last being the personnel of the Canadian Medical Advisory Committee.

The duties of the Board were to tabulate, analyse, and utilize the results of the survey made by the Canadian Medical Association of physicians registered in Canada, with a view to determining the number of doctors available for appointment to the armed services of Canada; as a result of information obtained in the survey, to allocate medical officers in the proper proportions for appointment to the three branches of the armed forces of Canada: to consider carefully, in relation to the available supply of physicians for appointment to the armed forces, the requirements of civilian institutions, public health departments, medical schools, war industries, and communities, in order that there shall be no impairment of essential public health services; to undertake the responsibility for investigating conditions at first hand regarding civilian needs and the possibility of making such arrangements as are expedient, where there is an apparent conflict between military and civilian needs; and to make further surveys and investigations with respect to the availability of physicians not reached by the survey, and who are eligible for appointment, in order that adequate provision may be made for the future requirements of the armed forces of Canada.

Effective 17 November 1942 under the provisions of Order-in-Council P.C. 10360, the scope of activity of the Board was extended to include, in addition to physicians, dentists, and medical and dental technical personnel. At the same time the Director of Dental Services was appointed a member of the Board which from then on was known as the Canadian Medical Procurement and Assignment Board. The field was further widened to include nurses in accordance with Order-in-Council P.C. 10934, dated 1 December 1942. On 6 October 1944, under the provisions of Order-in-Council P.C. 7523, the duties of the Board were again extended to include the survey of post-graduate and refresher training facilities in Canada designed to meet the needs of ex-service personnel in the fields of medicine and public health,

and the placement opportunities in Canada for medical practitioners. This same Order-in-Council authorized the following persons to be additional members of the Canadian Medical Procurement and Assignment Board: a representative appointed by the Association of Canadian Medical Colleges; a representative appointed by the Royal College of Physicians and Surgeons of Canada; and a representative appointed by the Canadian Hospital Council.

Again, on 13 November 1945, under the provisions of Order-in-Council P.C. 6890, the following additions and deletions were made: a medical representative of the Department of National Health and Welfare was appointed a member of the Board and, as the office of Director of Medical Services, Department of Pensions and National Health, had been abolished, his membership on the board was taken by the Director General of Treatment Services, Department of Veterans Affairs; also as the position of Medical Director of National War Services had been absorbed by the National Selective Service, it was deleted from membership on the Board.

To assist the Central Board, divisional advisory committees were established in each province. These committees were composed of a chairman and secretary and representatives from the provincial medical association, the medical services, liaison officers, and such other individuals as the chairman asked to serve. These committees acted as advisers to the central board on all matters in the province or military district concerned. They served without remuneration. The central board could not have functioned satisfactorily without their assistance. The members offered their time, experience, and knowledge of local conditions to assist demobilized medical officers with rehabilitation problems.

An outstanding contribution of the Board was the compilation of the National Health Survey which was published by the King's Printer in 1943. This survey outlined the medical manpower situation in the Dominion and had sections dealing with such pertinent subjects as public health, hospitals, industrial medicine, dental, and nursing services.

Another publication prepared by the Board and circulated to all doctors was *Facts About Your Medical Career on Demobilization*. This brochure was issued under the authority of the Minister of Veterans Affairs and covered in question and answer form particulars of refresher courses, post-graduate training, placements, and miscellaneous appointments.

Functions of the Board at the end of the war included: advice and assistance in securing priority release of doctors from the services to universities, to hospitals, to government departments, and to communities in urgent need of medical attention; arrangement of seconding of service medical officers to meet immediate urgent needs of communities, hospitals, or institutions; advice to government departments on labour exit permits required by doctors for study or employment outside Canada; advice to Department of Veterans Affairs concerning availability of post-graduate and refresher

courses for demobilized medical officers; liaison between universities and hospitals and the services with respect to interns and undergraduates; maintenance of statistical information on all Canadian doctors.

The value of this organization is difficult to assess but there is no doubt that it did assist materially in the equitable distribution of trained medical personnel during that period when acute shortages developed. Its action was hampered by the lack of mandatory or compulsory powers which made its recommendations ineffectual at times. It is important to note that excellent results were achieved in the vast majority of cases through the local committees, who were able to persuade the person involved to take the necessary action in a national interest. It is certain that some such organization will be a prime requisite during any future mobilization.

CIVIL DEFENCE

The increasing tension in the international situation in the decade following 1930 forced upon the peace-loving nations of the world an urgent need for security. Canada, as a member of the British Commonwealth might well be involved in an European or Asiatic war and to meet this possibility a Canadian Defence Committee was set up. At its first meeting on 20 August 1936 the question of the protection of the civilian population was discussed. The Chief of the General Staff was of the opinion that the direct protection of the civilian population from aerial bombs or gas attacks should not be the responsibility of the Department of National Defence.

Following the first meeting of the Defence Committee the Chief of the General Staff pressed for the formation of various inter-departmental sub-committees, one of which should be charged with the responsibility of examining the problems of Air Raid Precautions. The proposal for the formation of these sub-committees received ministerial approval in April 1937 and it was announced at the Imperial Defence Conference in May that Canada was setting up a defence organization similar in principle to the Committee on Imperial Defence. The inter-departmental committee on air raid precautions under the chairmanship of the Deputy Minister of the Department of Pensions and National Health held its first meeting on 21 March 1938. There was no Canadian precedent for the action which the committee was required to take, namely: "to inquire into and report upon the non-military measures which should be adopted against the possibility of air attack, including gas attack", but fortified with some early editions of a British handbook on A.R.P., six annual reports of the U.K. A.R.P. sub-committee, and an estimate of the forms and scale of air attacks to which Canada might be exposed, the committee submitted its report on 30 June 1938.

The compilation of this report was made difficult by the government request for absolute secrecy. Plans for the protection of the civilian population had to be formulated without any knowledge of provincial and municipal resources. The report strongly recommended that the provincial and municipal authorities be taken into the confidence of the federal government and all local resources made known. Even without this necessary knowledge the committee clearly recognized that some provisions should be made for the purchase of necessary equipment and materials. It urged the government to take immediate steps for the manufacture of gas masks, for the construction of auxiliary fire equipment, and for the training of instructors.

Following the submissions of its reports the Inter-departmental Committee on A.R.P. became inactive but the chairman, who had always assumed that A.R.P. measures were the responsibility of the Department of Pensions

and National Health, did not await formal approval of the report by Council before setting up, in May 1938, a departmental committee to carry out the recommendations of the report.

The first task of the departmental committee was the preparation of a handbook on A.R.P. to assist provincial and municipal authorities when the time came to set up local organizations. The title of this handbook was *Air Raid Precautions, General Information for Civil Authorities*. The handbook was not issued until August 1939 when the provincial organization of A.R.P. was begun. Meanwhile, the departmental committee was considering defence against attacks on vulnerable coastal areas. In August 1938 the committee asked authority to purchase from the United Kingdom 1000 civilian gas masks and 100 special duty gas masks. It proposed to begin training immediately on receipt of this equipment. The committee urged the government to make plans at once for the provision of 3,000,000 civilian and 100,000 special duty type gas masks as well as 100,000 gas-proof suits, for the use of police, firemen, reserve workers, and others. These recommendations were brought before the Prime Minister on 30 August 1938 but no action appears to have been taken and no authority received to proceed with preparations until August 1939. Nevertheless the St. John Ambulance Association continued to make preparations for civil defence. Throughout the winter of 1938-39 anti-gas and first aid training was stepped up and a number of instructors, both men and women were qualified.

The problems of fire hazards were investigated. The development of auxiliary fire fighting corps and fire protection of munitions factories, oil storage depots, and refineries were discussed. The main point of the discussions was that the auxiliary forces should be three times the size of the permanent brigades. Details on available fire fighting equipment in centers considered vulnerable were collected. Maps showing the location of all storage depots were prepared.

It was not until the Polish crisis in August 1939 that the government lifted its cloak of secrecy and allowed the departmental committee of the Department of Pensions and National Health to put its proposed scheme into operation. The committee immediately dispatched representatives to Nova Scotia, New Brunswick, and British Columbia. One week later Quebec was approached but Ontario indicated that at this time it did not wish to participate in the scheme. Delegates of the departmental Committee went forth to explain the principles of A.R.P. to the provincial premiers concerned, to advise them on the necessary steps to be taken to set up A.R.P. measures, and to offer the co-operation of the federal government. At Ottawa, the Minister of the Department of Pensions and National Health had obtained authority to spend up to \$150,000 on A.R.P. measures.

The next step was the appointment of a federal air raid precautions officer who, with an assistant and clerical help, set up an executive office

whose functions were never clearly defined, but if judged in retrospect appear to have included the following:

- (1) To assist and advise the provincial and municipal authorities on matters of policy and organization.
- (2) To act as a medium of consultation with outside authorities.
- (3) To supervise the manufacture of A.R.P. equipment.
- (4) To inspect provincial A.R.P. schemes.
- (5) To prepare and distribute pamphlets and other publications on A.R.P.

PROVINCIAL A.R.P. ORGANIZATIONS

The officials of the Department of Pensions and National Health who approached the provincial governments outlined the terms of reference, composition, and functions of provincial and local executive organizations on A.R.P. but as the federal authorities did not insist on the strict letter of the text, there were wide variations in organization among the different provinces. However, the importance placed on the development of a sound system is shown by the type of individual chosen to form the provincial committees. In Nova Scotia, for example, the provincial committee was composed of such members as the Minister of Health, the Deputy Minister of Highways and Public Works, the Attorney General, the Chief Health Officer, the General Manager of Nova Scotia Light and Power Company, the Officer Commanding R.C.M.P., the Provincial Fire Marshal, the provincial head of the St. John Ambulance Association, and the head of the provincial division of the Canadian Red Cross Society. Local committees at two centres, designated as vulnerable, were established, one at Halifax, one at Sydney. These committees were made up of leading men in the community.

The provincial committee of Nova Scotia was chiefly concerned with the arrangement for practice black-outs and for setting up first aid posts. The first practice black-out was held on 5 September 1939. A total of 31 first aid posts was set up and an ambulance service for the collection of casualties was provided. The enrolment of special constables and auxiliary firemen was begun. In New Brunswick where St. John was considered to be the only vulnerable point, the local committee for that municipality acted as the provincial committee. Here, as in Halifax, the first concern was the arrangement for practice black-outs and the establishment of first aid posts. In addition, the St. John committee prepared an elaborate evacuation scheme for moving non-essential persons to the interior of the province. British Columbia was organized in much the same manner as Nova Scotia and New Brunswick. Besides the provincial committee, local committees were formed at Victoria and Vancouver. In Quebec the provincial committee was organized with local committees at the cities of Montreal and Quebec.

EXPANSION OF AIR RAID PRECAUTION MEASURES

The fall of France in 1940 and the increased possibility that Canadian centres might be attacked by bombardment from the sea or by long range aircraft resulted in the intensification of A.R.P. measures throughout Canada. Ontario which had declined to adopt any civil defence measures was now willing to organize A.R.P. measures in 14 municipalities which were considered vulnerable. A provincial committee was appointed and the vulnerable communities were divided into separate areas each under the jurisdiction of a regional officer. In May 1941 the first practice black-out was held in Toronto. The Ottawa-Hull area, with the large number of government agencies and employees, was organized under a separate A.R.P. committee which operated under the direct supervision of the Minister of Pensions and National Health.

In November 1941 the Chiefs of Staff had declared that a much larger area of Canada was exposed to risk of air attack. The areas of definite risk included the entire provinces of Nova Scotia, New Brunswick, and Prince Edward Island, all the lower St. Lawrence Valley, and the coastline of British Columbia. The areas considered as slight risk included all the western portion of the province of Quebec as far north as James Bay, north-western portion of the province of Ontario as far west as the 58° W. longitude, southern Ontario, and the interior of British Columbia west of the Cascade Mountains.

By the end of 1943, Nova Scotia had 102 communities in which A.R.P. units were operating. The number of personnel engaged in A.R.P. work numbered 27,650. In New Brunswick, 88 A.R.P. units were in operation with an enrolment of 17,750. In Prince Edward Island 37 towns and villages developed A.R.P. units with a total enrolment of 1080. Quebec had 145 A.R.P. units organized by March 1943 with a total enrolment of 37,600 workers. Ontario developed an elaborate organization with 123 A.R.P. units and 71,586 registered workers. British Columbia was well organized and had 139 A.R.P. units in operation with an enrolment of 62,845 workers. The Prairie Provinces were not included in the vulnerable areas and did little more than form skeleton organizations.

The medical features of the A.R.P. programme were well developed. In Nova Scotia, for example, the local committees for each area set up first aid report centres at strategic points. The original plan was to have many first aid stations in each area but it was learned from experience in the United Kingdom that a few large report centres were preferable to a large number of small first aid posts. The hospital facilities in each locality were surveyed as to the accommodation available and the ease with which convalescent patients could be transferred to make room for casualties. Ambulances were improvised from transfer buses and trucks that were found suitable for stretcher carriage. Patrols of these make-shift ambulances were to work in the streets and evacuate all serious casualties to hospitals and minor casualties to the report centres. In case the telephone communication system broke

down, Boy Scout patrols were organized to act as messengers so that the flow of casualties could be equally distributed among the report centres. The personnel and equipment of a typical report centre consisted of the following:

- 1 doctor in charge
- 2-4 assistant doctors
- 1 ambulance officer with an assistant
- 1 secretary
- 1 assistant secretary
- 6 stretcher squads with five men to each squad
- 1 patrol of nine Boy Scouts
- 6 ambulances with drivers
- 6 motor cars with drivers
- 4 registered nurses
- 4 women workers trained in first aid
- 5 patrols with two first aid trained men to each patrol.

Each report centre was equipped with first aid supplies, facilities for minor surgery, emergency lighting, and oil heaters for water and sterilization purposes.

In 1939 there was no general warning system and no adequate method for spotting and tracking the approach of enemy aircraft, submarines, or surface vessels. It was anticipated that A.R.P. units would have little warning in advance of an emergency. In most cases a system of communication was established between the District Officer Commanding (Army) and the Provincial A.R.P. Headquarters. The latter notified their local units by telephone. In some cases, local defence establishments whether Army or Air Force undertook to warn local A.R.P. units.

The Army depended on the Air Force for warning of approaching aircraft and as the R.C.A.F. detection service improved it was decided to transmit warnings direct from the Air Force Commands to A.R.P. control centres. This plan was adopted on a nationwide basis in May 1943. However, most localities had some type of siren in use and when these were sounded local power whistles joined in.

Stand Down

The reassessment of the vulnerable areas by the Chiefs of Staff in November 1943 excluded the entire province of Ontario from that exposed to the risk of attack. Consequently, the provincial committee and most of the local committees were disbanded in December 1943. A few border communities were left intact because the Office of Civil Defence in the United States had not yet ordered to stand down. These border communities had combined their warning facilities with those across the border and it was felt that they could not disband without interfering with the protective measures of these United States border municipalities.

The general order for the demobilization of civil defence was ordered in March 1945. In Nova Scotia, the Halifax unit continued to function until October as it was felt that the movement of large amounts of munitions through this port always constituted a danger. It was a fortunate decision as the A.R.P. units in Halifax did excellent work following the Dartmouth Arsenal explosion on 18 July 1945.

The Japanese balloon bombs in the spring of 1945 forced the A.R.P. units of British Columbia to remain active after the general stand down order. The provincial committee requested and obtained federal financial support to deal with this menace and final disbandment of civil defence measures was therefore delayed until August 1945.

In many communities, certain features of the wartime civil defence organization continued to serve the community in a peacetime role. This is especially true of the auxiliary fire fighting services. These were organized into voluntary fire brigades. The provinces of Prince Edward Island, New Brunswick, and British Columbia bought all fire equipment provided by the federal government with the result that more than 500 small communities previously without any organized fire protection now have well organized, trained, and equipped brigades.

THE DEPARTMENT OF NATIONAL HEALTH AND WELFARE, 1939-1945

The Department of National Health and Welfare was established with effect from 21 October 1944, by Proclamation dated 13 October 1944. On that date the Honourable Brooke Claxton was appointed Minister of National Health and Welfare. On 3 November 1944, Dr. G. B. Chisholm was appointed Deputy Minister of Health, and G. F. Davidson was appointed Deputy Minister of Welfare. The Department consisted of three branches: Health, Welfare, and Administration.

INDUSTRIAL HEALTH DIVISION

In 1939 it became obvious that health supervision of war industry would be necessary. Health clauses were inserted in all government contracts, requiring that health and sanitary conditions be maintained at levels satisfactory to the Minister of Health. As there existed in Canada only three divisions of industrial hygiene, one at Ottawa, one in Ontario, and one in Quebec, the insertion of the contract clause presented a serious problem in administration. At that time there were only two provincial departments of health equipped to carry out this work. To add to these difficulties, scientific and medical personnel required for this work were moving to production and armed services' duties.

The first measure, taken to ensure the most efficient use of available industrial health personnel in the federal and provincial governments, was to have the Department of Munitions and Supply present the names of war contractors to the federal government. These lists were broken down by provinces and routinely disseminated on a confidential basis to the respective provincial health departments. In the case of those provinces where industrial hygiene divisions did not exist, the federal division appended an analysis of the contracts indicating those plants in which serious hazards to health might be expected.

The staff of the federal Division of Industrial Hygiene was increased by a physician and scientists trained in industrial health techniques; these specialists were to inspect war contract premises in provinces where industrial hygiene was not developed, i.e., all provinces except Ontario and Quebec. Since trained personnel were not available, arrangements were made to train personnel at a short course at Harvard University.

By late 1941 the need for creation of industrial health laboratories operating centres in Winnipeg and Vancouver was evident, and these were brought into being early in 1942, under joint federal-provincial auspices.

Maritime contract premises were inspected by members of the federal Division of Industrial Hygiene operating from Ottawa, where the Industrial Health Laboratory had been enlarged in the meantime. Thus the situation was brought under control across the entire Dominion.

Largely as a result of the spread of subcontracting practice, the value of the contract health clause gradually diminished, and by early 1942 the need became apparent for reliance upon executive authority in connection with the work of maintaining health in war industry. Accordingly, an Order-in-Council P.C. 1550 dated 2 March 1942 was promulgated, and the Minister of National Health was made responsible for its administration.

Although the administration of the Order-in-Council did not differ appreciably from the practice already described for supervision of war contract premises under the contract clause, some significant changes in the Division's activities did occur.

Since certain classes of contractors were required to institute medical or nursing services for employees, these and other classes of employers were also required, under authority of the Order, to report monthly to the Department on the health of their employees. For this work, a supervising industrial nurse was added to the Division's staff. Close liaison was maintained with those Divisions already established.

Plans for proposed industrial installations were examined, and manufacturers engaged in dangerous processes were required to submit details to the Division for their scrutiny.

As war production extended more and more to the provinces which had previously little industrial development, the supervision of new industrial plants added to the supervisory problems of the federal Division of Industrial Hygiene, and the problem was not dealt with effectively until the last year of hostilities.

Health control was effected in war plants in the following ways:

- (a) Inspection
Inspections were carried out on a limited percentage of war contract premises by provincial and federal officials from the Division allocated to the various centres. proposed plans for construction were scrutinized to ensure that health arrangements were included.
- (b) Review of Proposed Manufacturing Plans
Proposed plans for construction were scrutinized to ensure that health arrangements were included.
- (c) Reporting Health Records
Some establishments were required to report health experiences such as number of clinic visits, absenteeism due to illnesses, and number of accident injuries with causes.
- (d) Medical and Nursing Services
Certain classes of establishments were required to institute medical or nursing supervision of employees.
- (e) Display of Posters
Thousands of health posters were distributed to war plants for display.

Many difficulties were encountered by the Industrial Health Division, including lack of provincial services to assist in carrying out this administration;

shortage of trained personnel which necessitated a period of training for this service; the lack of co-operation from the Department of Munitions and Supply; and the scarcity of available industrial health statistics.

As a result of the Dominion-wide supervision of war plants the federal industrial Health Division gained much experience by their first-hand supervision which previously had been the responsibility of a provincial official. Experience gained from this scheme will be of great benefit to them in handling future post-war contracts.

A favourable balance of provincial indebtedness was also set up which has already proven valuable in post-war years by encouraging federally-sponsored standards of operation.

It gave industry a chance to appreciate the economical value of maintaining a health service in their establishments. It was also evident by their co-operation that Canadian manufacturers appreciated the government's health effort.

Not only were many personnel trained in this important work, but a basis of training was arrived at where it was found that successful training consisted of having untrained personnel spend six months to one year as technical assistants in the Division, this being followed by a course of five months at the Department of Industrial Hygiene of the Harvard School of Public Health.

Reports sent in by manufacturers provided valuable statistics for wartime studies, and will be beneficial in comparing peacetime studies of incidence of occupational disease and industrial ill-health.

Much illness was avoided as a result of the federal provincial co-operation in this health effort. It is uniformly agreed among health workers and manufacturers that the attention paid to good lighting, proper ventilation, and general health supervision, confined to low levels the amount of occupational illness among industrial workers, and in this way was of practical importance in the war effort.

The health experience described above was mainly due to the inspections of hundreds of plants where analyses of air measurements and lighting were undertaken. These estimations disclosed many work situations where danger of poisoning or threat to health existed. During 1944 alone, the federal industrial health officers carried out over 900 such determinations in a working population of 500,000 persons. The organization proved valuable because it was possible for a limited staff of health workers to visit the work places of hundreds of thousands of war workers, and to carry out scientific observations on conditions in such places.

A survey conducted in 1939 showed that 50 percent of establishments with more than 500 employees had a formal arrangement for providing the services of a physician to the staff. A similar survey in 1943 by the Canadian Medical Procurement and Assignment Board revealed the same percentage,

but also showed that since 1939 there had been an increase of 50 per cent in the number of establishments of over 500 employees which provided the services of a nurse during working hours.

The fact that the provinces of Manitoba and British Columbia, which previously had no industrial health services, took over their units for peacetime operations provides a measure of the value of the units to provincial business during wartime. Indications are that the three other provinces assisted; viz., Alberta, Saskatchewan, and Nova Scotia, will also take over field units which have been lent from Ottawa.

MEDICAL INVESTIGATION DIVISION

The Medical Investigation Division was organized in 1934 for the purpose of the medical examination of civil servants and the compilation of medical statistics on civil servants.

At the outbreak of war in September 1939, the staff consisted of three medical officers, two chief clerks, one registered nurse, two stenographers, three clerks, and one messenger; a total of 12. When the coding of statistics was discontinued, three clerks were released.

In November 1941, examinations as to fitness for duty as merchant seamen were commenced. By November 1945, 452 prospective merchant seamen had been examined.

In 1942 the Division started inoculations for certain members of legation staffs proceeding abroad. This service was extended to the Trade Commissioners' staffs of the Department of Trade and Commerce.

In December 1942, organization work in connection with chest x-rays of civil servants in Ottawa for tuberculosis detection was started.

In May 1945, the Division started to form a Registered Nurses Service.

The growth of the staff from 12 in 1939 to 18 by 1944 lagged far behind the increase in volume of work done.

Other services of the Division during the war included: discussion of nutrition problems with personnel officers of the various federal departments; advice and assistance to federal departments from time to time in regard to public health aspects in federal government buildings; advice and assistance about recreational projects and commencement of a mass programme of blood Wasserman and haemoglobin tests for civil servants located in Ottawa.

It was found that there was much to be done in the way of visiting government buildings and personnel. A solid foundation for future activities in the field of health directing for civil servants was provided.

By the close watch which was maintained on civil servants their health was not jeopardized by the longer working hours which were experienced frequently during the war years. Beneficial results were also obtained from the x-ray surveys and the blood Wasserman and haemoglobin tests conducted in some federal civil service centres.

By the examination of merchant seamen, and the inoculation of civil service personnel slated to proceed abroad, situations where medically unfit cases might proceed overseas were reduced to a minimum.

THE NARCOTIC DIVISION

The primary function of the Division is to administer the Opium and Narcotic Drug Act.

During the Second World War the Department of National Defence sought the confidential advice of the Narcotic Division on the eligibility of officers about to be commissioned to the Medical or Dental Corps. Similar checking was performed for the Canadian Medical Procurement and Assignment Board respecting applicants for appointments. Close liaison also existed with the directors of medical services of the armed forces on narcotic supplies, and the Division was frequently called upon for advice on many matters of internal medical control of narcotics.

Because it was evident at the outbreak of hostilities that a complete cessation of narcotic imports was possible, an Order-in-council P.C. 2635 was passed cancelling all previous exemptions in the narcotic field, such as codeine and its preparations. All narcotics were placed on a prescription basis.

The strict regulations enforced on narcotics brought a fantastic rise in prices in the underworld. This brought into the narcotic picture a large number of burglars, safe-blowers, hold-up men, and others who found the theft of narcotics from wholesalers, hospitals, and drug stores, most profitable.

An arrangement was made with the United States whereby opium could be purchased from that country in the event that Canada's import supply was cut off. Arrangements were also made to purchase drugs from the United Kingdom.

As a result of the restrictions on narcotics, Canadian consumption of codeine dropped from 40,500 ounces in 1937 to 25,500 ounces in 1940; for the four subsequent years the annual average was 30,000 ounces.

Due to the restrictions imposed and the work carried out by the Division during the war years, no acute shortage of straight narcotic drugs developed in Canada. These restrictions produced the desirable social effect of reducing narcotic consumption to a low level.

The activities of the underworld engaged in pilfering narcotics were energetically combated in co-operation with the various police forces throughout Canada and with the United States Narcotic Service.

THE NUTRITION DIVISION

It was not until 2 March 1942 that an Order-in-Council, P.C. 1550, was passed which controlled the supervision of eating facilities in war plants. In many cases it was then too late to ensure proper space and equipment for these facilities.

When food rationing came into effect there was some misunderstanding by the industrial field in adapting the preparation of menus to conform with these regulations. In such cases the Nutrition Division assisted in the preparation of menus and acted as liaison between the ration administration and the individual plants.

A Cafeteria Committee was established under the Department of Munitions and Supply to minimize losses chargeable to the Crown and resulting from the operation of food services. This committee as well as the Nutrition Division sent inspectors to cafeterias, resulting in a duplication of effort. The recommendations of each were made independently and were frequently contradictory and confusing.

Problems were encountered in obtaining and training a sufficient and suitable staff for the research of clinical findings and food habits.

As a result of research the Nutrition Division was able to provide technical advice to other government departments; e.g., advice on feeding Eskimos, and on food supplies for weather stations. Progress was made also in co-ordinating information material for release to the public, which involved the bringing together for discussion of the many people concerned. Recommendations through the Scientific Advisory Committee of the Canadian Council on Nutrition were also made with respect to emergency ration kits for the armed forces.*

PUBLIC HEALTH ENGINEERING DIVISION

The wide scope of the supervisory duties of the Engineering Division of the Department of National Health and Welfare was expanded during wartime by co-operation with the Civil Aviation Division, the United States Public Health Services, the Royal Canadian Navy, the Royal Canadian Air Force, the Department of Munitions and Supply, and other Dominion Government Departments, in matters pertaining to health problems.

Experience gained during the Second World War indicated the necessity for an increased staff of technically qualified and fully trained professional engineers, with design and construction experience in water supply, sewage disposal, and sanitation systems. If such vacancies on the staff cannot be filled, it is recommended that fellowships be offered at the universities giving specialized training in Public Health Engineering.

For purposes of mutual co-operation and exchange of information and experiences gained, matters of water supply, sewage disposal, and sanitation generally for all Departments of the Dominion Government should be referred to the Division for review of proposals and final designs prior to the commencement of construction.

* FEASBY, W. R., *Official History of the Canadian Medical Services*, 1939-1945, Volume II, pp. 147-165.

It was also recommended that in peace or war, the Department of National Defence regard the Public Health Engineering Division as an organization specially qualified to advise and help with public health engineering problems relating to their undertakings. It has been found in the past that collaboration along the lines suggested has been very valuable since the Division has much relevant information.

DIVISION OF QUARANTINE, IMMIGRATION, MEDICAL, AND SICK MARINERS' SERVICES

The wartime activities of the Quarantine Service consisted of clearance of all vessels by medical officers according to quarantine regulations, anti-plague and rat-guarding measures, and sanitation on board. Radio pratique* was suspended and all vessels were inspected by departmental medical officers on arrival, without advance notice. This made necessary an enlarged staff of medical officers and boarding crews. Halifax was especially involved. During the year 1941-42, out of a total for all Canada of 5784 vessels inspected, 3488 were cleared at Halifax. This might be compared with the year 1937-38 when a total of 2783 vessels were inspected, of which 472 were cleared at this Atlantic port. Quarantine medical officers acted as advisers to the naval authority where complaints were made of poor sanitation or food, or of impure water on board vessels.

As a result of the activities of this service, there were no entries of major infectious diseases into Canada during the war and all minor diseases were adequately treated. Bubonic plague was kept out of Canadian ports. A noteworthy success was scored by the Quarantine Service in the treatment of diphtheria cases among crews of ships at Halifax during the diphtheria epidemic in the city early in the war.

The Immigration Medical Service withdrew its medical officers from Europe at the outbreak of war, with the exception of one part-time doctor who remained at Lisbon, and two officers at London. The usual service was maintained at Canadian ports. All allied seamen granted temporary entry into Canada were medically examined. Arrangements were also made whereby rescued crew members of the allied merchant marine were given adequate hospital care.

The Sick Mariners' Service administered to the health needs of all allied merchant seamen using Canadian ports. Foreign seamen stranded in Canada because of mental or physical disability, and who could not be repatriated, were given maintenance and treatment. In 1941-42 the number of sick mariners treated was more than triple that of 1937-38. A special hospital ship service was maintained at the two convoy ports of Halifax and Sydney. Medical officers made daily rounds of vessels at anchor in these

* Pratique was the licence granted a vessel to enter port after having performed quarantine.

two ports. Clinics were established and outfitted and additional medical and other staff secured, especially for the three crucial ports of Halifax, Sydney, and St. John.

The Quarantine, Immigration and Sick Mariners' Services rendered an absolutely essential service at Canadian seaports, especially Halifax. All three activities were inseparable and formed the medical service of the Merchant Navy.

MISCELLANEOUS WAR ACTIVITIES

The divisions of the Department, mentioned below, played only a limited part in wartime activities and are therefore described briefly.

The Food and Drug Division examined food for the Department of National Defence and drugs for the Inspection Board of the United Kingdom and Canada.

The Laboratory of Hygiene assisted the Department of National Defence by providing a bacteriological and biological service. The Laboratory of Hygiene also processed stores, and distributed blood for transfusions to Connaught Laboratories, Toronto, and McGill University, Montreal.

Employees of the *Directorate of Indian Health Services* located in northern areas were instructed to be on the lookout for landings of Japanese balloons and to report promptly any observations or unusual occurrences of a suspicious nature.

THE CANADIAN RED CROSS SOCIETY

Ever since that hot day in June 1859, when Henri Dunant stood on the battlefield of Solferino in Italy and saw 40,000 dying and wounded men lying untended on the ground, the primary purpose of the Red Cross which he founded has been to furnish volunteer aid to the sick and wounded.

Canada's first participation in Red Cross occurred in the Riel Rebellion when soldiers were transferred from the field of battle on springless wagons serving as ambulances under the protection of the Red Cross flag. The infant Canadian society assisted its soldiers in the Boer War at the turn of the century, but it was not until the First World War that it reached a mature status.

At the close of the First World War, Red Cross expanded its activities "in time of peace or war to carry on and assist in work for the improvement of health, the prevention of disease, and the mitigation of suffering throughout the world".

The Canadian Society, therefore, was in active working order when the Second World War was declared and was in a position to offer immediate aid to the government and its Department of National Defence. In wartime, the Red Cross functions as a voluntary auxiliary to this Department.

Its contribution to the medical services of the armed forces fell into five main categories. These were: the collection of blood and blood plasma; the provision of volunteer assistants in connection with hospitals both at home and overseas; assistance to hospitalized veterans in Canada and abroad; and the building and equipping of a military hospital.

The supply of prisoner-of-war parcels may be said to fall in with these categories, since there is no doubt of their beneficial effect on the health and well-being of those who were captured.

When Canada officially declared war, Red Cross had already prepared a list of needed hospital and medical supplies and soldiers' comforts. When the first Canadian troops landed in England before Christmas of 1939, they found Red Cross warehouses well stocked with supplies.

Through women's workrooms and committees, set up throughout the country, 700,000 Canadian women volunteered their time and effort to turn out all manner of hospital and medical supplies, as well as comforts for active servicemen and relief clothing for civilians. Twelve million, five hundred thousand articles were made for hospitals and medical units alone in the six years of war.

Hospitals and operating rooms were supplied with bedding and bed-linen, with pyjamas and shoulder shawls, dressing gowns, hospital trousers, surgical towels, surgical socks, operating room linen, sterilized surgical dressings, and many other items.

As the tide of casualties mounted, Women's Work Committees provided specially needed articles. In 1940, for example, the British Government called for 500 special aviator belts for use in dive bombing. In 1943, the sterilized surgical dressings were packed in metal containers so they would be available in smaller parcels for forward dressing stations and field hospitals. Supervision of design, packing, and sterilizing was carried out by doctors and nurses.

After 1943, supplies to hospitals and medical units were limited largely to articles which were not provided by Ordnance, such as special operating boots.

Large amounts of mobile equipment were donated totalling 355 ambulances, 41 mobile canteens, 40 trailer kitchen canteens, 20 station wagons, 50 trucks for carrying prisoner-of-war parcels in Europe, and 33 blood donor vehicles.

To supplement the diet of men in hospital, as well as for civilian war sufferers in Britain, 2,469,544 pounds of jam, jelly, and honey were shipped overseas. This was produced in co-operation with Women's Institutes and other organizations. During 1946, \$6000 was donated to purchase fruit and tomato juices, since jam and honey supplies were difficult to obtain.

Special shipments of molasses were made on request of the Basingstoke Plastic and Neurological Hospital in England as easily assimilated nourishment for those patients suffering from jaw and facial injuries.

Other equipment, including radios, rugs, furniture and furnishings, was supplied to military hospitals, nurses' residences, hostels, and clubs in Canada and Britain.

Canada's school children, through the 30,000 branches of Junior Red Cross, made their own contribution to the medical services.

Girl members made a weekly quota of 1500 tape supporters for blood serum bottles for the Connaught Laboratories. In various blood donor clinics held after school hours, they served refreshments to donors and cleaned and assembled instruments.

Junior boys made 150,000 arm splints, 1319 test tube racks, and a number of trays and boxes for surgical instruments at the request of the Royal Canadian Army Medical Corps.

Two beds at Taplow Hospital were endowed by two junior branches, and special vehicles, including mobile kitchens and ambulances for use in Britain, were supplied on request, totalling \$77,022 in cost.

In veterans' hospitals at home, Juniors joined in hospital visiting chores and are still continuing the work of making special Christmas, Easter, and Valentine bed-tray favours, and bed-trays, game-boards, and other recreational equipment.

Fifteen thousand Canadian women and girls volunteered for service in the Canadian Red Cross Corps, and, of these, 641 served overseas in

Great Britain and in the European theatre of war. They served not only as office workers and dietitians, but as ambulance and transport drivers, as volunteer nursing aids in British civilian hospitals and at St. Dunstan's, as welfare officers attached to military hospitals in Britain and Europe.

At the end of the war in Europe, in September 1945, Canada's Red Cross Commissioner in North-West Europe reported that "too much credit cannot be given to the girls of the Red Cross Corps . . . They won everyone's admiration, did a grand job among the casualties, and got on excellently with the nurses", he said. "They left a great name behind them. Whatever they had to do, they did well".

At home, Corps members served in similar capacities, and in addition met every troop train and returning ship. They also assisted in Red Cross blood donor clinics across the nation.

The greater availability and use of transfusion therapy as far forward as regimental aid posts is credited by doctors as one of the three factors that cut the toll of deaths from wounds in the Second World War. Two million donations of blood were given by Canadians in wartime through the Red Cross for the forces.

As early as 1939, Ottawa Branch of the Red Cross was blood grouping members of the R.C.A.M.C. unit there at the request of the officer commanding. Research laboratories were striving to make blood transfusions available in the front lines, and the Toronto Red Cross Branch was asked for 1200 initial volunteer donors.

When it was realized that blood plasma could be transported more easily and in greater quantities to the front lines, the Canadian Red Cross Society, as the result of an appeal by Dr. C. H. Rest, agreed to finance research into the drying of blood plasma to the extent of \$10,000 and made \$5000 available immediately. Plasma and serum have the great advantage of being universal in type.

Red Cross, by 1943, had established 662 blood donor clinics across Canada, located in every province, and a steady supply of blood was flowing into the plasma-processing and drying laboratories.

Overseas, the Canadian Society established Taplow Hospital in England, considered by leading army medical authorities as one of the finest military hospitals of its type. On the declaration of war, Lord and Lady Astor immediately offered the use of their estate outside London to the Canadian Red Cross. At the cost of \$1,000,000 Red Cross built a fully modern, completely equipped 600-bed hospital there. It opened in 1940 and until it was closed in March 1946, a total of 25,068 patients were treated by the R.C.A.M.C. Consisting of 41 hut buildings made of steel, cement, and asphalt, it was centrally heated and had glassed-in sunrooms at the end of each ward.

In order to give a home-like atmosphere for its Canadian patients, Red Cross furnished it with maple furniture and scarlet blankets for the comfortable, spring-mattress beds. The hospital was staffed and maintained by the Army.

In addition to the hospital, Red Cross set up a research laboratory in connection with it, the cost of the laboratory building and equipment totaling \$20,000. The laboratory was established to study rare as well as ordinary conditions brought on by war.

Nine new Red Cross Lodges, located at the principal veterans' hospitals across Canada, were built and equipped by the Society at a cost of \$950,000 and in 1950 seven were still serving as canteen and recreational clubs for veteran patients, and providing overnight accommodation for their visiting relatives.

For patients in hospital both overseas and at home, the Society organized a personal service of hospital visitors. Extra comforts, library service, letter writing, and many other personal services were given, ranging from darning socks to shopping errands.

In July 1946, National Office of Red Cross inaugurated a film service for veterans in Canadian hospitals and institutions and an average of two to three entertainment films a week were screened.

Work of Canadian Red Cross Corps members, who served as Welfare Officers overseas and in hospitals at home, led to the formation of the present Arts and Crafts Division, providing recreational therapy for Canadian veterans in D.V.A. hospitals.

Red Cross helped in the establishment of the four Canadian hospitals in Newfoundland, providing hospital supplies, not yet available from military stores in the early days, and carrying on a hospital visiting service for the patients. In 1943, Canadian Red Cross Corps girls arrived to assist in transportation and delivery, in office work, and in hospital welfare, including instruction in recreational handicrafts.

The bulk of the Red Cross Society wartime expenditure was for prisoner-of-war parcels.

Out of the \$114,478,926 for wartime expenditure, up to the end of 1946, \$47,529,114 was for prisoner-of-war parcels; \$38,306,276 for assistance to allied nations, including Women's Work and the Canadian United Allied Relief Fund; \$6,524,996 for the welfare of the services, repatriation, and Red Cross Corps, and \$2,463,403 for wartime Blood Donor Service.

A total of 16,000,000 food parcels were packed at six Red Cross packing depots across Canada and shipped by the Society for Canadian, British, and allied prisoners of war.

Thousands of letters from ex-prisoners testify that these food parcels often saved their lives and were a potent factor in keeping up their health and morale.

The parcels contained 16 articles of food and other essentials and were based on a scientific study of food values made by a special committee on nutrition problems. Dried food was selected to keep the weight down and save shipping space; perishable foods, such as butter and cheese, were packed in tins.

As early as February 1940, two Canadians imprisoned in Germany were already receiving these Red Cross parcels. Total weekly pack eventually reached the high point of 149,600 parcels as workers struggled to reach the objective of a parcel a week for each prisoner.

A typical parcel contained 16 ounces of sweetened, condensed milk; eight ounces butter; eight ounces fat pork meat; four ounces cheese; 12 ounces corned beef; ten ounces pork luncheon meat; eight ounces salmon or pressed rolled oats; three and a half ounces fish paste; eight ounces dried apples; eight ounces dried prunes; eight ounces sugar; 16 ounces jam (pectin); 16 ounces pilot biscuits; four ounces pea and bean soup powder; one ounce salt and pepper; six or eight ounces coffee; two ounces soap.

In the camps, every part of the parcel was utilized by the prisoners, the tin cans being turned into cups, plates, and even small stoves, the cartons themselves becoming handy cupboards.

In 1942, a repatriated prisoner of war in England reported he had received 14 parcels in one year in a prison camp in Italy.

"Canadian parcels were rated the highest in our camp", he wrote, "the reason? — they contained butter, sugar, biscuits which are the best in the world, cheese always in perfect condition, wonderful chocolate. Please keep up the good work. Without Canadian parcels, life, already grim, would be almost impossible."

The Canadian public contributed \$80,000,000 in voluntary donations to the Red Cross during the war years. Ninety-five percent of the Society's work was accomplished by volunteers, which increased the value of its goods and services approximately two and a half times.

With the help of the people of Canada, the Canadian Red Cross Society was able in the Second World War to fulfil its historic purpose of furnishing volunteer aid and comfort to the sick and wounded of its armed forces.

THE ST. JOHN AMBULANCE

When the Crusaders entered Jerusalem in 1099 they found near the Holy Sepulchre the a hospice kept by a body of men called the Brothers of the Hospital of St. John of Jerusalem. They were so impressed by the good work of the Order that many of the Knights became enrolled. During the next eight hundred years the Knights of the Hospital of St. John of Jerusalem worked and fought throughout Europe and the Middle East nursing the sick and wounded and protecting the pilgrims going to and from the Holy Land.

Like other monastic orders the Priories of St. John in England disappeared during the Reformation and members of the Order dispersed or fled to their headquarters at Malta.

In 1858 the English branch was revived as a purely national Order and received a Royal Charter 30 years later as the Order of St. John of Jerusalem in England. From this new beginning the Order, seeking to meet the needs of the modern age, established the St. John Ambulance Association in 1877 to provide courses of instruction in first aid and kindred subjects, and later, in 1887, founded the St. John Ambulance Brigade, a corps of trained men and women to be available at all times to render first aid and nursing assistance in the community and to reinforce the medical branches of the armed services in time of war. In subsequent years these new forms of the humanitarian service of the Order spread throughout the Commonwealth, and were in turn adapted to the needs of the respective countries.

In Canada the earliest recorded first aid class was held in Quebec in 1883 for women. Some months later a class was organized in Kingston, Ontario, presumably for men, and in the following year a class was held at the Royal Military College which may be considered to be the first certificated St. John Ambulance course for the armed forces in Canada and the beginning of a long and close connection between the organization and the forces.

Gradually local and provincial branches of the St. John Ambulance Association were formed across the country and in 1897 a Dominion Council with headquarters in Toronto was founded. Later the Canadian Branch was established in Ottawa in 1910 and incorporated by Act of Parliament in 1914.

The next step in the development of St. John service, the formation of units of trained volunteers, was begun in 1908 when an Ambulance Division for men was organized in London, Ontario, to be followed some years later by a Nursing Division in Toronto. From these original units the organization steadily progressed. During the First World War the women's branch particularly gained impetus as the result of service of some hundreds of

V.A.Ds. in Canada and overseas. By 1939 ambulance divisions and nursing divisions had been established in most provinces of the Dominion, and later still their allied cadet units were similarly extended.

From the outset the potentialities of such units were apparent and the years have since provided a wealth of evidence that corps of volunteers continuously trained and actively engaged in service in the normal life of the community can readily be adapted to the needs of great emergencies whether of epidemic, disaster, or war. Motivated by the desire to be of service and inspired by the long tradition of voluntary humanitarian effort the men and women of the Brigade give their time freely, for the most part in their spare time from the responsibilities of home and occupations.

While even in its earliest annual reports reference is made to the fact that St. John Ambulance courses are chiefly intended to benefit those in industry and that has been its largest field, the instructional work of the organization has to a large extent been carried on through the armed forces and other organized groups such as police, firemen, scouts, schools, and universities.

St. John's connection with the forces has perhaps nowhere been closer than in Canada either in peace or war. Many St. John-trained men have enrolled in the R.C.A.M.C. and in turn many ex-R.C.A.M.C. personnel have been stalwarts of the ambulance divisions. During the First World War Canadian troops were supplied with an abridged edition of the St. John First Aid Manual and many were well trained in the basic principles of first aid. A British publication of the time stated that "The Canadian troops are all instructed in the method of rendering succour to their comrades in the case of wound or accident and we see no reason why this training should not be extended to the British soldiers." From a contemporary official St. John report it was pointed out that the Canadian Expeditionary Force was the first army to adopt training of this type (i.e., in the basic principles of first aid).

During the Second World War while the Army evolved a short course of Battle First Aid and an abridged textbook was again prepared by St. John and issued to the Department of National Defence, personnel were encouraged to complete the more thorough certificated course. A somewhat similar procedure was followed in the Navy. In one year largely because of the decision that all Air Force personnel must be taught first aid, over 23,000 members of the forces qualified in the complete course for St. John Ambulance awards. In several districts during the war St. John Ambulance Brigade members volunteered their services to assist with this instruction, and in Manitoba particularly assistance was given in courses for the R.C.A.F., Winnipeg Grenadiers, Cameron Highlanders, Fort Garry Horse, and the reserve army units. Not only were the forces themselves trained but a further 10,000 Junior certificates for those 16 years and under were granted to the members of the cadet corps during the war years.

Training in St. John first aid courses reached its peak in 1942 when some 107,000 passed examination in the fully certificated courses. Included were members of the armed forces, civil defence personnel, and the many auxiliary corps and voluntary organizations for which first aid training was a qualification.

Members of the medical profession in all areas, in spite of the greatly increased burden of wartime demands, directed and carried out much of the active training, and did all the examining. The remainder fell to certificated lay instructors. All were indefatigable in their efforts, perhaps traveling miles to classes, some teaching two and three classes a day, and in many instances giving their services voluntarily as part of their war effort.

In the field of home nursing close co-operation was maintained with the Canadian Nurses Association and much assistance was received in the revision of the *Home Nursing Manual* and in planning the V.A.D. programme. Advisory committees were formed in the provinces in conjunction with the provincial branches of the Nurses Association and the same unselfish, untiring assistance was given in the training and examining of the home nursing classes. Within the nursing profession itself first aid training was very much extended. Courses were given in schools of nursing and in addition many graduate nurses subsequently continued on to become certificated first aid instructors as well as A.R.P. instructors.

In June 1943 a joint board was established by the Canadian Red Cross and the Order of St. John so that the complete resources of both organizations in first aid and home nursing should be co-ordinated and conducted in their joint names. Funds were made available from the Canadian Red Cross campaigns to enable the Order to carry out its work, the budgets of the Order being submitted to the Department of National War Services. In addition to the Federal Joint Board, provincial joint committees were formed and the scheme of co-ordination was maintained throughout the remainder of the war.

Co-operation among the voluntary organizations and welfare services is public service at its best and St. John units carried out a great diversity of duty in conjunction with the Red Cross, the Navy League, hospitals and clinics, as well as its own first aid and nursing service. Undoubtedly the most spectacular example of this was in Nova Scotia and one that was closest to front-line experience.

In 1942 St. John offered its services to the Navy League to help care for sick and injured merchant seamen and survivors who might arrive at the Navy League Club, Halifax. A daily clinic was established with a doctor, nurse, and nursing auxiliaries in attendance. As the Battle of the Atlantic developed and the number of cases increased a complete hospital ward or sick bay was set up in the club and equipped for all but serious surgical cases. A day and night nurse was maintained by the Navy League and the rest of the staffing and ambulance service was carried out by St. John Volunteers,

requiring a rota of over fifty women each week. On one occasion in conjunction with the sick bay a hospital train was organized at very short notice to bring stretcher cases — all of whom were suffering from immersion foot — from Liverpool, N.S., to Halifax and for this both medical and nursing personnel were provided by St. John units.

With the great shortage of nurses in cities and the even greater shortage in smaller communities the potentialities of assistant nurses was recognized during the war in a way perhaps that they never had been before. A fact which was to lead to a policy among nursing and medical authorities following the war of according a definite status to such assistance and integrating it in the nursing service of the country. Understandably, some diffidence existed at first in accepting the assistance of the enthusiastic and patriotic auxiliary in busy wards with the supervisory staffs already far over-taxed, yet the product of home nursing classes and practical training in voluntary units won her way through her ability and her willingness to undertake any nursing task however menial. Department of Veterans Affairs' hospitals and civic hospital, clinics, and sanatoria across the country received thousands of hours of voluntary assistance. In British Columbia alone St. John nursing auxiliaries carried out approximately 180,000 hours of duty in four years; proportionate amounts were contributed in Nova Scotia, Ontario, Quebec, and Manitoba. A number of very efficient training centres for auxiliaries were established by St. John but the organization also owed much to the co-operation of hospital staffs in providing the additional training and experience, particularly for those qualifying to serve with the R.C.A.M.C. or overseas as V.A.Ds.

Another branch of service in which an equally great proportion of St. John members was engaged was that of the Canadian Red Cross Blood Donor Clinic. In almost every district they were very actively engaged and formed a large proportion of the nursing auxiliary staff. In 1942 while continuing assistance with the Blood Donor Clinics the St. John also set up its separate Blood Grouping Service, primarily to take care of the civilian population and those in industry in the event of emergency. Later, after the wartime blood donor service for the forces was closed down, blood grouping service was carried on by St. John as part of its peacetime programme.

The greatest single contribution of the St. John Ambulance to the war effort was its participation in the civil defence of Canada. Three years before the federal government made known its civil defence programme in 1939, the St. John Ambulance had begun training its personnel as anti-gas instructors and increasing its number of first aid instructors. In 1938 the Chairman of the Federal Committee on Civil Defence, recognizing the necessity of utilizing the service of St. John Ambulance and contrary to the wishes of National Defence to admit "outsiders" at a time when official secrecy prevailed, on his own initiative included the Director of the St. John Ambulance as a member of his committee. When the civil defence programme was announced in August 1939 provincial and municipal committees were

the British Ministry of Health and were posted to all parts of Great Britain, including a small group who went to Guernsey after the liberation to help relieve the nurses who had served throughout the German occupation.

Service varied widely in scope. In hospitals and convalescent homes it often meant much responsibility through the drastic shortage of trained nursing sisters; or on the other hand many housekeeping tasks in meeting the lack of domestic staff. For the ambulance drivers attached to the British army commands in Great Britain and North-West Europe there was perhaps the endless servicing of vehicles in the boredom of isolated posts; or the great demands of driving long hours in the circuit between evacuation aircraft or hospital ships, and hospitals, often in convoy in the pin-point light of the black-out, their duties embracing nursing care as well as driving.

The members who served with the Westminster civil defence were attached to mobile surgical units and to the first aid posts or air raid shelters. One task in which they took particular pride was their staffing, as a Canadian St. John unit, of the medical aid post in the Leicester Square Tube Station throughout the buzz bomb period. At times during the height of the attack the population of this shelter numbered over a thousand.

Numbers of welfare officers were attached to the British army hospitals of North-West Europe, and were on hand in Belgium to take part in the strenuous duties of the first hectic rush of liberated prisoners of war from German camps. Others were posted to various districts in France in connection with the distribution of relief food and clothing among civilians. Some served still further afield by assisting in the repatriation or exchange of prisoners of war to Sweden, Marseilles, Lisbon, and Gibraltar. Still others either as V.A.Ds. or welfare officers were posted for duty in India, Malaya, and Singapore where they served in military hospitals and later in the great refuge camps among liberated prisoners of war after the capitulation of Japan.

The London Headquarters was finally repatriated in October 1946. It was over a year after hostilities had ceased before the needs of the hospitals began to taper off noticeably. In Canada, however, there had been many new requests for members to meet trains of returning wounded and liberated prisoners of war and later for first aid duty among the enormous welcoming crowds in many of the larger cities across the country.

St. John Ambulance lost many of its members through enlistments in the forces, many of them to the medical services, yet the expansion during the war was comparable to that of military services. With the termination of war duty there was no stand-down of the organization. Peace found it more widely established throughout the country, the scope of its work greatly increased and, even with the retirement of those who had joined for the war emergency only, its numbers five times greater than before the war.

APPENDIX "A"

**MEDICAL COMPONENTS OF C.A.S.F.
1 SEPTEMBER 1939**

Coast Defence and Vulnerable Point Duty

| <i>UNIT</i> | <i>PLACE</i> |
|---------------------------------------|--------------------------------|
| No. 2 Field Ambulance (Details)..... | Toronto, Ont. (M.D. 2) |
| No. 12 Field Ambulance (Details)..... | Vancouver, B.C. (M.D. 11) |
| No. 13 Field Ambulance (Details)..... | Victoria, B.C. (M.D. 1 1) |
| No. 14 Field Ambulance (Details)..... | St. John, N.B. (M.D. 7) |
| No. 19 Field Ambulance (Details)..... | Quebec, Que. (M.D. 5) |
| No. 21 Field Ambulance (Details)..... | Charlottetown, P.E.I. (M.D. 6) |
| No. 22 Field Ambulance (Details)..... | Halifax, N.S. (M.D. 6) |

Mobile Force

| | |
|--|------------------------------|
| <i>1st Division</i> | |
| No. 4 Field Ambulance..... | Fort William, Ont. (M.D. 10) |
| No. 5 Field Ambulance..... | Hamilton, Ont. (M.D. 2) |
| No. 9 Field Ambulance..... | Montreal, Que. (M.D. 4) |
| No. 3 Field Hygiene Section | Kingston, Ont. (M.D. 3) |
| <i>2nd Division</i> | |
| No. 10 Field Ambulance..... | Regina, Sask. (M.D. 12) |
| No. 11 Field Ambulance..... | Guelph, Ont. (M.D. 1) |
| No. 18 Field Ambulance..... | Quebec, Que. (M.D. 5) |
| No. 2 Field Hygiene Section | Toronto, Ont. (M.D. 2) |
| <i>Corps Troops</i> | |
| No. 8 Field Ambulance..... | Calgary, Alta. (M.D. 13) |
| No. 13 Field Hygiene Section | Edmonton, Alta. (M.D. 13) |
| No. 2 Motor Ambulance Convoy | Montreal, Que. (M.D. 4) |
| (from No. 6 Field Ambulance) | |
| <i>Army Troops</i> | |
| No. 4 Casualty Clearing Station | Edmonton, Alta. (M.D. 13) |
| No. 5 Casualty Clearing Station | Ottawa, Ont. (M.D. 3) |
| No. 1 Motor Ambulance Convoy | Hamilton, Ont. (M.D. 2) |
| (HQ and one section only) | |
| No. 1 Advanced Depot Medical Stores | Kitchener, Ont. (M.D. 1) |
| (from No. 24 Field Ambulance) | |
| No. 1 Mobile Bacteriological Laboratory..... | Montreal, Que. (M.D. 4) |
| (formed on mobilization) | |
| No. 1 Mobile X-Ray Laboratory | Winnipeg, Man. (M.D. 10) |
| (formed on mobilization) | |

L of C Troops

| | |
|--|----------------------------|
| No. 5 Field Hygiene Section | Quebec, Que. (M.D. 5) |
| No. 1 General Hospital (600 beds) | Montreal, Que. (M.D. 4) |
| No. 5 General Hospital (600 beds) | Winnipeg, Man. (M.D. 10) |
| No. 8 General Hospital (600 beds) | Saskatoon, Sask. (M.D. 12) |
| No. 13 General Hospital (1 200 beds) | Hamilton, Ont. (M.D. 2) |
| No. 14 General Hospital (1200 beds) | Montreal, Que. (M.D. 4) |
| No. 15 General Hospital (1200 beds) | Toronto, Ont. (M.D. 2) |
| No. 1 Convalescent Depot | Montreal, Que. (M.D. 4) |
| (from No. 4 General Hospital) | |
| No. 1 Base Depot Medical Stores | Ottawa, Ont. (M.D. 3) |
| (formed on mobilization) | |

MILITARY HOSPITALS – BED CAPACITY
1939-1945

| YEAR | MD1 | MD2 | MD3 | MD4 | MD5 | MD6 (incl. Nfld) | MD7 | MD10 | MD11 | MD12 | MD13 (incl. PC) | TOTAL | IN- CREASE | DE- CREASE |
|------|-----|-------|-------|-----|-----|------------------------|-------|------|-------|------|-----------------------|--------|---------------|---------------|
| 1939 | 20 | 52 | 43 | 40 | 50 | 65 | — | 40 | — | — | 20 | 333 | — | — |
| 1940 | 220 | 1,060 | 770 | 310 | 285 | 1,295 | 490 | 225 | 520 | 150 | 250 | 5,575 | 5,242 | — |
| 1941 | 220 | 1,290 | 1,090 | 375 | 335 | 1,480 | 525 | 310 | 600 | 300 | 340 | 6,865 | 1,290 | — |
| 1942 | 370 | 1,725 | 1,425 | 420 | 380 | 1,520 | 685 | 585 | 1,625 | 435 | 1,105 | 10,275 | 3,410 | — |
| 1943 | 535 | 1,815 | 1,325 | 570 | 295 | 1,690 | 770 | 525 | 1,925 | 485 | 1,040 | 10,975 | 700 | — |
| 1944 | 535 | 2,640 | 1,325 | 897 | 305 | 1,640 | 1,035 | 675 | 2,535 | 485 | 985 | 13,057 | 2,082 | — |
| 1945 | 535 | 1,965 | 1,260 | 530 | 250 | 1,175 | 710 | 325 | 1,875 | 450 | 900 | 9,975 | — | 3,082 |

(figures compiled from General Orders)

THE FIELD MEDICAL SERVICE DECEMBER 1942**First Canadian Army***Army Troops*

- No. 6 Canadian Casualty Clearing Station
- No. 2 Canadian Motor Ambulance Convoy
- First Canadian Army Field Hygiene Section
- First Canadian Army Mobile Bath Unit

4th Canadian Armoured Division

- No. 12 Canadian Light Field Ambulance
- No. 15 Canadian Light Field Ambulance
- No. 16 Canadian Light Field Ambulance
- No. 12 Canadian Light Field Hygiene Section
- No. 4 Canadian Mobile Bath Unit

5th Canadian Armoured Division

- No. 7 Canadian Light Field Ambulance
- No. 13 Canadian Light Field Ambulance
- No. 24 Canadian Light Field Ambulance
- No. 11 Canadian Light Field Hygiene Section
- No. 6 Canadian Mobile Bath Unit

1st Canadian Corps*Corps Troops*

- No. 8 Canadian Field Ambulance
- No. 2 Canadian Casualty Clearing Station
- No. 4 Canadian Casualty Clearing Station
- No. 5 Canadian Casualty Clearing Station
- No. 1 Canadian Motor Ambulance Convoy
- No. 5 Canadian Field Hygiene Section
- No. 1 Canadian Advanced Depot Medical Stores
- No. 5 Canadian Mobile Bath Unit

1st Canadian Division

- No. 4 Canadian Field Ambulance
- No. 5 Canadian Field Ambulance
- No. 9 Canadian Field Ambulance
- No. 2 Canadian Field Hygiene Section
- No. 1 Canadian Mobile Bath Unit

2nd Canadian Division

- No. 10 Canadian Field Ambulance
- No. 11 Canadian Field Ambulance
- No. 18 Canadian Field Ambulance
- No. 13 Canadian Field Hygiene Section
- No. 2 Canadian Mobile Bath Unit

3rd Canadian Division

- No. 14 Canadian Field Ambulance
- No. 22 Canadian Field Ambulance
- No. 23 Canadian Field Ambulance
- No. 7 Canadian Field Hygiene Section
- No. 3 Canadian Mobile Bath Unit

1st Canadian Army Tank Brigade

- No. 2 Canadian Light Field Ambulance

Canadian Military Headquarters

Army Troops Under Command

- No. 1 Canadian Mobile Hygiene Laboratory
- No. 1 Canadian Mobile Bacteriological Laboratory

C.M.H.Q. Troops

- No. 2 Canadian Base Depot Medical Stores

DISTRIBUTION OF MEDICAL UNITS
IN THE FIELD ARMY

15 May 44

*AAI**1 Infantry Division*

4 Field Ambulance
 5 Field Ambulance
 9 Field Ambulance
 1 Field Dressing Station
 2 Field Dressing Station
 2 Field Hygiene Section

5 Armoured Division

7 Light Field Ambulance
 24 Field Ambulance
 13 Field Dressing Station
 11 Field Hygiene Section

1 Armoured Brigade

2 Light Field Ambulance

1 Corps

5 Field Hygiene Section
 8 Field Dressing Station
 4 Casualty Clearing Station
 5 Casualty Clearing Station

Army Troops (Canadian Element)

1 Field Transfusion Unit
 2 Field Transfusion Unit
 3 Field Transfusion Unit
 3 Field Dressing Station
 16 Field Dressing Station

GHQ and L of C (Canadian Element)

3 General Hospital (200 beds)
 1 General Hospital (600 beds)
 5 General Hospital (600 beds)
 14 General Hospital (I 200 beds)
 15 General Hospital (I 200 beds)
 1 Convalescent Depot
 (2000 capacity)
 1 Field Surgical Unit
 2 Field Surgical Unit
 3 Field Surgical Unit

*21 ARMY GROUP**2 Infantry Division*

10 Field Ambulance
 11 Field Ambulance
 18 Field Ambulance
 21 Field Dressing Station
 4 Field Dressing Station
 13 Field Hygiene Section

3 Infantry Division

14 Field Ambulance
 22 Field Ambulance
 23 Field Ambulance
 5 Field Dressing Station
 7 Field Dressing Station
 7 Field Hygiene Section

4 Armoured Division

12 Light Field Ambulance
 15 Field Ambulance
 12 Field Dressing Station
 12 Field Hygiene Section

2 Armoured Brigade

17 Light Field Ambulance

2 Corps

8 Field Hygiene Section
 6 Field Dressing Station
 2 Casualty Clearing Station
 3 Casualty Clearing Station

First Army (Canadian Element)

14 Field Hygiene Section
 6 Casualty Clearing Station
 4 Field Transfusion Unit
 5 Field Transfusion Unit
 6 Field Transfusion Unit
 7 Field Transfusion Unit
 9 Field Dressing Station
 10 Field Dressing Station
 11 Field Dressing Station

AAI

- 4 Field Surgical Unit
- 1 Mobile Hygiene Laboratory
- 1 Mobile Bacteriological Laboratory
- 1 Advanced Depot Medical Stores

CMHQ Units

- 1 Research Laboratory
- 1 Anti-Malaria Control Unit
- 2 Anti-Malaria Control Unit
- 3 Anti-Malaria Control Unit
- 4 Anti-Malaria Control Unit
- 5 Anti-Malaria Control Unit

21 ARMY GROUPS

GHQ and L of C(Canadian Element)

- 6 General Hospital (200 beds)
- 8 General Hospital (600 beds)
- 7 General Hospital (600 beds)
- 16 General Hospital (600 beds)
- 10 General Hospital (1200 beds)
- 21 General Hospital (1200 beds)
- 22 General Hospital (1 200 beds)
- 23 General Hospital (1200 beds)
- 24 General Hospital (1200 beds)
- 2 Convalescent Depot (2000 capacity)
- 3 Convalescent Depot (1000 capacity)
- 5 Field Surgical Unit
- 6 Field Surgical Unit
- 7 Field Surgical Unit
- 8 Field Surgical Unit
- 9 Field Surgical Unit
- 10 Field Surgical Unit
- 11 Field Surgical Unit
- 10 Field Hygiene Section
- 2 Mobile Hygiene Laboratory
- 2 Mobile Bacteriological Laboratory
- 2 Base Depot Medical Stores
- 2 Advanced Depot Medical
- 1 Mobile Neurosurgical Unit

**STATIC MEDICAL INSTALLATIONS IN THE
UNITED KINGDOM, 15 MAY 1944**

| INSTALLATIONS | LOCATION | FIELD UNIT OPERATING | STATIC BED CAPACITY |
|---|---------------------------------|------------------------|---------------------|
| Taplow General Hospital | Taplow, Buckinghamshire. | 11 C.G.H. (600 beds) | 600 |
| Bramshott General Hospital | Bramshott, Hampshire. | 2 C.G.H. (1,200 beds) | 1200 |
| Aldershot General Hospital | Farnborough, Hampshire. | 4 C.G.H. (600 beds) | 600 |
| Horsham General Hospital | Horsham, Sussex. | 9 C.G.H. (600 beds) | 600 |
| Cuckfield General Hospital | Cuckfield, Sussex. | 13 C.G.H. (600 beds) | 500 |
| Marston Green General Hospital | Birmingham, Warwickshire. | 19 C.G.H. (600 beds) | 600 |
| Pinewood General Hospital | Crowthorne, Berkshire. | 17 C.G.H. (600 beds) | 600 |
| Cherry Tree General Hospital | Colchester, Essex. | 18 C.G.H. (600 beds) | 600 |
| Horley General Hospital | Horley, Surrey. | 12 C.G.H. (1,200 beds) | 900 |
| Leavesden General Hospital | Watford, Hertfordshire. | 20 C.G.H. (1,200 beds) | 1200 |
| Basingstoke Neurological and Plastic Surgery Hospital | Basingstoke, Hampshire. | | 600 |
| No. 1 Canadian Special Hospital | Alton, Hampshire. | | 300 |
| Alderbrook Park Convalescent Hospital | Cranleigh, Surrey. | | 50 |
| Roman Way Convalescent Hospital | Colchester, Essex. | | 1200 |
| Alton Convalescent Hospital (dormant) | | | |
| Massey Foundation Convalescent Home for Canadian Officers (Garnons) | Staunton-on-Wye, Herefordshire. | | 40 |
| Digswell Place, Nursing Sisters Convalescent Home | Welwyn, Hertfordshire. | | 35 |
| No. 1 Canadian Medical Centre | Bordon, Hampshire. | | 150 |
| No. 2 Canadian Medical Centre | Witley, Surrey. | | 75 |
| No. 3 Canadian Medical Centre | Rushmoor, Hampshire. | | 150 |
| No. 4 Canadian Medical Centre | Cove, Hampshire. | | 75 |

APPENDIX "F"

**PERSONS HOLDING PRINCIPAL MEDICAL AND
DENTAL APPOINTMENTS**

1939-1945

The list of appointments ends with the cessation of hostilities against Japan. Limitations of space permit the inclusion of only the most senior appointments. Directors in Canada and overseas, and, in the case of the Army, D.Ds.M.S. and A.Ds.M.S. of the field formations and echelons, are shown.

Officers are shown with rank and decorations as of the day on which they relinquished the appointments concerned. Names of officers who held acting appointments or were detailed temporarily are not shown unless they were subsequently confirmed in the appointments. No distinction is made between acting and confirmed rank.

**ROYAL CANADIAN NAVY
CANADA**

MEDICAL DIRECTOR GENERAL*

Surgeon Commodore A. A. McCallum, O.B.E.,
V.R.D., C.D. 14 Feb. 40 - 3 Jan. 53

OVERSEAS

STAFF MEDICAL OFFICER, CANADIAN NAVAL MISSION OVERSEAS

Surgeon Commander C. W. MacCharles 26 May 44 - 8 Feb. 45
Surgeon Captain A. L. Anderson, O.B.E. 9 Feb. 45 - 10 Aug. 45

**CANADIAN ARMY
CANADA**

DIRECTOR GENERAL OF MEDICAL SERVICES

Colonel† J. L. Potter (Acting from
12 Jan. 36) 5 Jul. 36 - 11 Nov. 39
Brigadier R. M. Gorssline, D.S.O. 12 Nov. 39 - 6 Sep. 42
Major-General G. B. Chisholm, C.B.E.,
M.C., ED 7 Sep. 42 - 2 Nov. 44
Major-General C. P. Fenwick, C.B., C.B.E.,
M.C., E.D. 24 Jan. 45 - 31 Jan. 46

* Known as Senior Naval Medical Officer from 14 Feb. 1940 to 30 Nov. 1941 and as Director of Naval Medical Services from 1 Dec. 1941 to 30 Jun. 1942.

† Honorary Brigadier upon retirement.

OVERSEAS

| | |
|--|--|
| DIRECTOR OF MEDICAL SERVICES, CANADIAN MILITARY HEADQUARTERS* | |
| Major-General R. M. Luton, C.B.E., M.C..... | 17 Oct. 39 - 28 Feb. 46 |
| DEPUTY DIRECTOR OF MEDICAL SERVICES, FIRST CANADIAN ARMY | |
| Major-General C. P. Fenwick, C.B.E., M.C., E.D. | 26 May 43-17 Dec. 44 |
| Brigadier H. M. Elder, D.S.O., E.D..... | 18 Dec. 44 - 14 Jul. 45 |
| Brigadier G. A. Sinclair, O.B.E., E.D..... | 18 Jul. 45 - 10 Dec. 45 |
| DEPUTY DIRECTOR OF MEDICAL SERVICES, 1ST CANADIAN CORPS | |
| Brigadier J. A. Linton, M.C..... | 14 Jul. 40 - 7 Apr. 43 |
| Brigadier E. A. McCusker, M.C., E.D..... | 8 Apr. 43 - 6 Nov. 44 |
| Brigadier H. M. Elder, D.S.O., E.D..... | 7 Nov. 44 - 7 Dec. 44 |
| Brigadier G. A. Sinclair, O.B.E., E.D..... | 15 Dec. 44 - 17 Jul. 45 (except for the period 25 Mar. - 21 Apr. 45) |
| DEPUTY DIRECTOR OF MEDICAL SERVICES, 2ND CANADIAN CORPS | |
| Brigadier C. P. Fenwick, M.C., E.D..... | 15 Jan. 43 - 25 May 43 |
| Brigadier C. A. Rae, E.D..... | 26 May 43 - 8 Apr. 44 |
| Brigadier G. R. D. Farmer, C.B.E., E.D..... | 9 Apr. 44 - 8 May 45 |
| Brigadier C. H. Playfair, C.B.E., E.D..... | 9 May 45 - 25 Jun. 45 |
| ASSISTANT DIRECTOR OF MEDICAL SERVICES, 1ST CANADIAN INFANTRY DIVISION | |
| Colonel J. A. Linton, M.C..... | 17 Oct. 39 - 19 Jul. 40 |
| Colonel E. A. McCusker, M.C..... | 20 Jul. 40 - 7 Apr. 43 |
| Colonel C. H. Playfair, O.B.E..... | 29 Apr. 43 - 8 Apr. 44 |
| Colonel G. A. Sinclair, E.D..... | 9 Apr. 44 - 20 Aug. 44 |
| Colonel W. L. Coke,† O.B.E. (detailed temporarily from 21 Aug. 44..... | 25 Aug. 44 - 15 Sep. 45 (except for the period 11 Oct. - 7 NOV. 44) |
| ASSISTANT DIRECTOR OF MEDICAL SERVICES, 2ND CANADIAN INFANTRY DIVISION | |
| Colonel C. P. Fenwick, M.C., E.D..... | 20 May 40 - 14 Jan. 43 |
| Colonel L. M. Stuart, E.D..... | 18 Jan. 43 - 1 Apr. 44 |
| Colonel B. C. Leech, E.D..... | 2 Apr. 44 - 5 Sep. 44 |
| Colonel S. G. U. Shier, O.B.E..... | 6 Sep. 44 - 7 Oct. 45 |
| ASSISTANT DIRECTOR or: MEDICAL SERVICES, 3RD CANADIAN INFANTRY DIVISION | |
| Colonel L. H. Leeson, E.D..... | 14 Sep. 40 - 26 Jul. 43 |

* Known as Senior Medical Officer from 17 Oct. 1939 to 12 Jul. 1940 and as Deputy Director of Medical Services from 13 Jul. 1940 to 18 Feb. 1941.

† Served as D.G.M.S. from 27 Oct. 47 - 15 Nov. 52.

| | |
|---|---|
| Colonel M. C. Watson, E.D..... | 3 Aug. 43 - 25 Sep. 44 |
| Colonel C. H. Playfair, C.B.E., E.D. | 19 Oct. 44 - 14 Jan. 45 |
| Colonel E. E. Tieman, O.B.E. (detailed temporarily from 15 Jan. 45)..... | 9 May 45 - 13 Jun. 45 |
| ASSISTANT DIRECTOR OF MEDICAL SERVICES, 3RD CANADIAN INFANTRY DIVISION (C.A.O.F.) | |
| Colonel K. A. Hunter, O.B.E..... | 9 Jun. 45 - 7 Jan. 46 |
| Colonel R. J. Nodwell | 8 Jan. 46 - 26 May 46 |
| ASSISTANT DIRECTOR OF MEDICAL SERVICES, 4TH CANADIAN ARMoured DIVISION | |
| Colonel W. A. Jones, V.D. | 26 Sep. 41 - 24 Feb. 44 |
| Colonel C. D. Gossage, O.B.E. | 25 Feb. 44 - 6 Jan. 45 |
| Colonel C. G. Wood | 7 Jan. 45 - 13 Jun. 45 (except for the period 21 May - 7 Jun. 45) |
| ASSISTANT DIRECTOR OF MEDICAL SERVICES, 5TH CANADIAN ARMoured DIVISION | |
| Colonel H. M. Elder, E.D. | 19 Mar. 41 - 12 Mar. 44 |
| Colonel K. A. Hunter, O.B.E..... | 13 Mar. 44 - 8 Jun. 45 (except for the periods 8-14 Dec. 44 and 25 Mar.-21 Apr. 45) |
| ASSISTANT DIRECTOR OF MEDICAL SERVICES, HEADQUARTERS ARMY TROOPS AREA, FIRST CANADIAN ARMY | |
| Colonel S. G. U. Shier | 28 Mar. 44 - 5 Sep. 44 |
| Colonel G. L. M. Smith, O.B.E. | 10 Dec. 44 - 13 Jun. 45 |
| Colonel G. C. Wood, O.B.E. | 14 Jun. 45 - 10 Dec. 45 |
| GENERAL HEADQUARTERS, 1st ECHELON (A.A.I.) | |
| Colonel K. A. Hunter*..... | 15 Oct. 43 - 12 Mar. 44 |
| Colonel G. R. D. Farmer, E.D. | 13 Mar. 44 - 8 Apr. 44 |
| Colonel C. H. Playfair, O.B.E. | 9 Apr. 44 - 18 Oct. 44 |
| Colonel G. A. Sinclair, E.D..... | 19 Oct. 44 - 10 Nov. 44 |
| Colonel C. S. Thompson, O.B.E..... | 11 Nov. 44 - 8 Apr. 45 |
| ASSISTANT DIRECTOR OF MEDICAL SERVICES, CANADIAN SECTION, GENERAL HEADQUARTERS, 1ST ECHELON (21 ST ARMY GROUP) | |
| Colonel G. E. Wight..... | 13 Mar. 44 - 25 Sep. 45 |
| ROYAL CANADIAN AIR FORCE CANADA | |
| DIRECTOR OF MEDICAL SERVICES (AIR) | |
| Air Commodore R. W. Ryan..... | 20 Sep. 40 - 14 Feb. 43 |
| Air Commodore J. W. Tice, C.B.E., E.D. | 15 Feb. 43 - 28 Feb. 46 |

* Served as D.G.M.S. 16 Nov. 52 - 14 Mar. 56.

OVERSEAS**DIRECTOR OF MEDICAL SERVICES R.C.A.F. OVERSEAS***

| | |
|---|------------------------|
| Lieutenant-Colonel K. A. Hunter | 9 Feb. 40 - 15 Jan. 41 |
| Wing Commander A. R. Tilley | 8 Feb. 41 - 30 Nov. 41 |
| Group Captain J. E. Hunter | 1 Dec. 41 - 31 Mar. 44 |
| Group Captain E. C. Noble..... | 1 Apr. 44 - 30 Jun. 45 |
| Group Captain A. A. G. Corbet, E.D..... | 1 Jul. 45 - 15 Dec. 45 |

**CANADIAN DENTAL CORPS
CANADA****DIRECTOR GENERAL OF DENTAL SERVICES†**

| | |
|--|------------------------|
| Brigadier F. M. Lott, C.B.E., E.D..... | 1 Sep. 39 - 31 Jan. 46 |
|--|------------------------|

DEPUTY DIRECTOR GENERAL OF DENTAL SERVICES‡

| | |
|---|------------------------|
| Colonel G. L. Cameron, D.S.O., O.B.E., V.D..... | 27 Mar. 41 - 6 May 45 |
| Colonel D. S. Coons, O.B.E., M.M., E.D..... | 15 May 45 - 31 Jan. 46 |

DEPUTY DIRECTOR OF DENTAL SERVICES (NAVY)§

| | |
|---|------------------------|
| Lieutenant-Colonel W. E. Meldrum, O.B.E. | 31 Mar. 43 - 3 Apr. 49 |
|---|------------------------|

DEPUTY DIRECTOR OF DENTAL SERVICES (AIR)††

| | |
|-------------------------------------|------------------------|
| Colonel D. S. Coons, M.M., E.D..... | 31 Mar. 43 - 14 May 45 |
|-------------------------------------|------------------------|

OVERSEAS**DEPUTY DIRECTOR OF DENTAL SERVICES, CANADIAN MILITARY****HEADQUARTERS* ***

| | |
|--|-------------------------|
| Lieutenant-Colonel W. G. Trelford, V.D. | 1 Aug. 40 - 20 Aug. 42 |
| Colonel L. V. Janes, O.B.E. | 15 Oct. 42 - 31 Jul. 45 |
| Colonel J. F. Edgecombe, O.B.E., E.D..... | 1 Aug. 45 - 26 Nov. 45 |

ASSISTANT DIRECTOR OF DENTAL SERVICES, CANADIAN MILITARY**HEADQUARTERS**

| | |
|--|------------------------|
| Lieutenant-Colonel R. H. McDougall, M.M. | 25 Mar. 43 - 28 May 45 |
| Lieutenant-Colonel C. B. H. Climo, D.C.M., E.D..... | 29 May 45 - 2 Oct. 45 |

ASSISTANT DIRECTOR OF DENTAL SERVICES (AIR), R.C.A.F.**OVERSEAS HEADQUARTERS**

| | |
|---|------------------------|
| Colonel E. M. Wansbrough, M.M., E.D..... | 24 Mar. 43 - 4 Aug. 45 |
| Lieutenant-Colonel R. H. McDougall, M.M. | 5 Aug. 45 - 5 Nov. 45 |

* Known as Principal Medical Officer until August 1942.

† Known as Director of Dental Services until 31 March 1944.

‡ Known as Deputy Director of Dental Services until 31 January 1944.

§ Known as Assistant Director of Dental Services until 25 April 1944.

†† Known as Assistant Director of Dental Services until 6 February 1944.

** Known as Assistant Director of Dental Services until 13 December 1942.

ASSISTANT DIRECTOR OF DENTAL SERVICES, FIRST CANADIAN ARMY

Lieutenant-Colonel J. F. Edgecombe 1 May 42 - 14 Oct. 43
(also during the period 10 - 28 Apr. 44)

Lieutenant-Colonel E. F. Allen..... 29 Apr. 44 - 16 Aug. 45

ASSISTANT DIRECTOR OF DENTAL SERVICES, CANADIAN SECTION,
GENERAL HEADQUARTERS, 1ST ECHELON (A.A.I.)

Lieutenant-Colonel J. F. Edgecombe, E.D. 15 Oct. 43 - 9 Apr. 44

Lieutenant-Colonel C. B. H. Climo, D.C.M.,
E.D..... 10 Apr. 44 - 8 Apr. 45

ASSISTANT DIRECTOR OF DENTAL SERVICES, CANADIAN SECTION,
GENERAL HEADQUARTERS, 1ST ECHELON (21ST ARMY GROUP)

Colonel J. F. Edgecombe, O.B.E., E.D..... 29 Apr. 44 - 24 Jul. 45

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Abbreviations

| | |
|-------------------|---|
| A.A.I. | Allied Armies Italy |
| A.A.L.O. | Australian Air Liaison Office |
| A.A. & Q.M.G. | Assistant Adjutant and Quartermaster General |
| A.D.D.S. | Assistant Director of Dental Services |
| A.D.M.S. | Assistant Director of Medical Services |
| A.D.S. | Advanced Dressing Station |
| A.F.H.Q. | Air Force Headquarters |
| A.F.R.O. | Air Force Routine Order |
| A.G. | Adjutant General |
| A.M.D. | Assistant Medical Director or Army Medical Department |
| A.M.P. | Air Member for Personnel |
| A.M.T. | Air Member for Training |
| ANC TPS | Ancillary Troops |
| A.O.C. | Air Officer Commanding |
| A.O.C. IN C. | Air Officer Commanding in Chief |
| A. R.P. | Air Raid Precautions |
| A.S.C. | Advanced Surgical Centre |
| B.C.A.T.P. | British Commonwealth Air Training Plan |
| BDE | Brigade |
| C.A.D.C. | Canadian Army Dental Corps |
| C.A.E.U. | Casualty Air Evacuation Unit |
| C.A.M.C. | Canadian Army Medical Corps |
| C.A.O. | Canadian Army Overseas or Canadian Army Order |
| C.A.O.F. | Canadian Army Occupation Force |
| C.A.S. | Chief of the Air Staff |
| C.A.S.F. | Canadian Active Service Force |
| C.C.S. | Casualty Clearing Station |
| C.D. & A.A. | Coastal Defence and Anti Aircraft |
| C.D.C. | Canadian Dental Corps |
| C.G.H. | Canadian General Hospital |
| C.H.Q. | Command Headquarters |
| C.I.U. | Clinical Investigation Unit |
| C.M.H.Q. | Canadian Military Headquarters |
| C.M.F. | Central Mediterranean Force |
| C.O.S.S.A.C. | Chief of Staff Supreme Allied Commander |
| D.A.D.H. | Deputy Assistant Director of Hygiene |
| D.A.G. | Deputy Adjutant General |
| D.D.G.M.S. | Deputy Director General of Medical Services |
| D.D.M.S. | Deputy Director of Medical Services |
| D.G.M.S. | Director General of Medical Services |
| DIV | Division |
| D.M.A. | Divisional Maintenance Area |
| D.M.O. | District Medical Officer |
| D.M.S. | Director of Medical Services |
| D.N.D. | Department of National Defence |
| D. ORG. | Director of Organization |
| D. PERS SELECTION | Director of Personnel Selection |

| | |
|-------------------|---|
| D.P. & N.H. | Department of Pensions and National Health |
| D.V.A. | Department of Veterans Affairs |
| E.F.T.S. | Elementary Flying Training School |
| E.M.S. | Emergency Medical Services |
| FD AMB. | Field Ambulance |
| F.D.S. | Field Dressing Station |
| F.F.I. | Free from Infection |
| F.P.M.S. | Flying Personnel Medical Section |
| F.S.U. | Field Surgical Unit |
| F.T.U. | Field Transfusion Unit |
| GEN HOSP. | General Hospital |
| G.H.Q. | General Headquarters |
| G.O. | General Order |
| G.O.C. | General Officer Commanding |
| G.O.C.-in-C. | General Officer Commanding in Chief |
| H.D. | Home Defence |
| H.M.S. | His Majesty's Ship |
| H.M.C.S. | His Majesty's Canadian Ship |
| I.T.S. | Initial Training School |
| L. OF C. | Lines of Communication |
| L.C.T. | Landing Craft Tank |
| L.S.T. | Landing Ship Tank |
| M.A.C. | Motor Ambulance Convoy |
| M.D. | Military District |
| M.D.G. | Medical Director General |
| M.F.H. | Mobile Field Hospital |
| M.I.R. | Medical Inspection Room |
| Mk. | Mark |
| M.O. | Medical Officer |
| N.C.O. | Non-Commissioned Officer |
| N.D.H.Q. | National Defence Headquarters |
| N.P.A.M. | Non Permanent Active Militia |
| N.R.M.A. | National Resources Mobilization Act |
| N.S.H.Q. | Naval Service Headquarters |
| O.C. | Officer Commanding |
| O.C.T.U. | Officer Candidate Training Unit |
| O.T. | Occupational Therapist |
| O.T.U. | Operational Training Unit |
| P.A.M. | Permanent Active Militia |
| PC. | Privy Council |
| P.D. | Personnel Depot |
| P.O.W. | Prisoner of War |
| R.A.A.F. | Royal Australian Air Force |
| R.A.F. | Royal Air Force |
| R.A.M.C. | Royal Army Medical Corps |
| R.A.P. | Regimental Aid Post |
| R.A.S.C. | Royal Army Service Corps |
| R.C.A.F. | Royal Canadian Air Force |
| R.C.A.F. (W.D.) | Royal Canadian Air Force (Women's Division) |
| R.C.A.M.C. | Royal Canadian Army Medical Corps |
| R.C.A.M.C. (N.P.) | Royal Canadian Army Medical Corps (Non Permanent) |
| R.C.A.S.C. | Royal Canadian Army Service Corps |
| R.C.E. | Royal Canadian Engineers |

Abbreviations

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| | |
|------------|---|
| R.C.N. | Royal Canadian Navy |
| R.H.L.I. | Royal Hamilton Light Infantry |
| R.M.O. | Regimental Medical Officer |
| R.N.V.R. | Royal Naval Volunteer Reserve |
| R.N.Z.A.F. | Royal New Zealand Air Force |
| R.O. | Routine Order |
| R.S. | Ration Scale |
| S. | Sa n. |
| S.B. | Stretcher Bearer |
| S.H.A.E.F. | Supreme Headquarters Allied Expeditionary Force |
| S.M.O. | Senior Medical Officer |
| T.A.F. | Tactical Air Force |
| U.K. | United Kingdom |
| U.S.N. | United States Navy |
| U.S.A.A.F. | United States Army Air Force |
| V.A.D. | Volunteer Aid Detachment member |
| W.D. | War Diary |
| W.E. | War Establishment |
| (W.R.) | West Riding |
| W.R.C.N.S. | Women's Royal Canadian Naval Service |

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