

Sir William Dawson

. . . Bringing the lives and deeds of our fore-runners vividly before us . . . imparts even to the most abstruse and technical subjects much of the personal charm which contact with strenuous, patient, and noble natures never fails to reveal. SIR ARCHIBALD GEIKIE, in "The Founders of Geology."

DEDICATED BY KIND PERMISSION TO
THE RIGHT HONOURABLE LORD STRATHCONA
AND MOUNT ROYAL, BARONET, &c., &c., &c.
CHANCELLOR OF MCGILL UNIVERSITY, MONTREAL, CANADA,
AND FOR SO MANY YEARS ASSOCIATED WITH
SIR WILLIAM DAWSON IN ADVANCING THE INTERESTS
OF HIGHER EDUCATION.

A

Brief Biographical Sketch

—OF—

Sir John William Dawson

C. M. G., LL. D., F. R. S., F. G. S.

By H. M. AMI

(of the Geological Survey of Canada)

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A Brief Biographical Sketch of
SIR JOHN WILLIAM DAWSON,
to which is appended a
List of his Writings arranged Chronologically.

By **HENRY M. AMI**, of the Geological Survey of Canada.

(Portrait).

On Sunday, the 19th day of November, 1899, there passed away to his long rest, one whose name has been inseparably connected with the progress and advancement of geological as well as palæontological research, in the Dominion of Canada. For a few years back Sir William Dawson's health began to fail as advancing years rolled on. The constant strain of a long life of intense activity and incessant labour, at last wore out the chords of life in his person. He died peacefully at his residence, 293 University street, Montreal, just as the first hour of the day of rest dawned, surrounded by his wife and constant companion and a number of his children. Sir William accomplished enough during his life, in the interests of education, science, and religion to satisfy any three hard-working individuals. He leaves behind him such monuments of industry and perseverance as few men do. The Peter Redpath Museum of McGill University alone is a monument which for ages will give food for thought to the coming generations, both to students of the university and to the geologists who seek to unravel the problems of geological science in the different portions of Canada, but more especially those of the maritime provinces, his native land

Sir William was born in the town of Pictou, Nova Scotia, on October 13, 1820. His grandfather was a Scotch farmer in comfortable circumstances who migrated to Nova Scotia early in the present century, and embarked in business in the town of Pictou. Sir William's father was a well-known book-seller, James Dawson, who was a gentleman of culture and attainments with a taste for study, and for many years supplied the needs of eastern Nova Scotia with the best literature, and published himself several works bearing upon the interest of this old crown colony.

During his early days in Pictou, he was instrumental and foremost in organizing one of the very first foreign missionary societies in British North America. He was one of those who helped to send the now renowned Dr. Geddie, pioneer and founder of the New Hebrides missions which have flourished so well and produced such excellent results.

The following is a brief epitome of his career after leaving Pictor College.

Leaving Pictou he went to Edinburgh University where he remained a winter, and took the degree of master of arts at the age of 22. In 1842 he returned to Canada, and during the summer of that year accompanied Sir Chas. Lyell in his geological exploration of Nova Scotia. In his contributions to the geology of that province, Sir Charles pays many tributes to the ability of his youthful companion as a geologist. Dr. J. J. Bigsby (*Thesaurus Devonico-Carboniferous*, p. vii, footnote) quotes a remark from the lips of Sir Charles Lyell regarding Sir William Dawson as follows: "On the death of Edward Forbes, Sir Charles Lyell remarked to me 'Now, I look chiefly to Dawson, of Montreal, for any true progress in the Philosophy of Geology.'"

We next find him carrying on a geological survey of the coalfields of Nova Scotia, for which task he had received the provincial appointment, and his report proved of great value. In 1846 he returned to Edinburgh University to carry on special researches and study practical chemistry and kindred subjects, bearing upon the prosecution of geological research.

In 1847 he married Miss Margaret A. Y. Mercer, of Edinburgh, and three years later was appointed superintendent of education for Nova Scotia, and was entrusted with the task of

putting a new act into operation. Meanwhile he contributed several papers on economic geology, zoology, and one on forestry.

The establishment of a provincial normal school for Nova Scotia was chiefly due to him, and Sir Edmund Head appointed him a member of a commission to regulate the affairs of Kings' College, now the University of New Brunswick. In 1854, he was elected fellow of the Geological Society of London, and in the following year, appointed principal and professor of natural science of McGill College, Montreal. It was through Sir Edmund Head also, then governor general of Canada, who as governor of Nova Scotia, had watched his career in that province, that the eminent fitness of Mr. Dawson became known to the governors of McGill College. They were in need of a principal, and had set certain desiderata before them as essential. The new principal must be a layman and besides this, they were determined, that the University should, though Protestant, be entirely undenominational. The principal must nevertheless be a religious man, one who would be a positive influence on the side of godliness. He must be capable and modern, and must of course be young, with his life before him. All these conditions were found in the young Nova Scotia geologist and in nothing were those who invited him disappointed.

When Sir William assumed the principalship of McGill University, it was a day of small things. The financial condition of that institution at that time made it necessary for him to undertake the duties of several laborious professorships along with those of administration. The revenue then amounted to only a few hundreds of dollars. There were only eight instructing officers, and with the exception of the faculty of medicine, the courses were most unsatisfactory. Under his guidance, however, the institution steadily advanced, and has long since over grown the effects of the depressing influences under which it labored when he was appointed. One of the great drawbacks to the success of the university was the lack of sufficient schools to prepare pupils for matriculation. With the co-operation of Sir Edmund Head, and of the superintendent of public instruction for the province of Quebec, in 1875 he secured the establishment of a normal school for Montreal, af-

filiated to McGill University, for the training of Protestant school teachers.

He was principal of McGill normal school for a period of thirteen years, in addition to his university duties. In 1858 he succeeded in establishing a school of civil engineering and surveying, which, however, after a severe struggle, succumbed at the end of five years to unfriendly legislation. Eight years later, however, he resuscitated this faculty of the university and placed it on a firm basis, so that to-day the faculty of applied science in McGill University is recognized as one of the best equipped and most thorough institutions, an object of pride not only to Montreal, but to the whole of the Dominion.

For eight years Sir William was a member of the board of Protestant commissioners of schools for the province of Quebec. He was also a member of the council of public instruction for the province of Quebec. In 1862 he was elected fellow of the Royal Society of England, and, in 1865 lectured before the British Association for the Advancement of Science in Birmingham. Five years later, 1870, he also lectured before the Royal Institute and Geological Society of London. In 1875 he was foremost in advocating the union of the several bodies forming the Presbyterian church in Canada, which union was effected in that year.

In 1881 he received the Lyell medal from the Geological Society of London for his important discoveries in science, and Her Majesty Queen Victoria created him a companion of the order of St. Michael and St. George, (C. M. G.), for his brilliant career in the same. In 1882 he was selected by the marquis of Lorne to be the first president of the Royal Society of Canada, which society has since flourished under both vice-regal and parliamentary patronage. In 1883 he was knighted by Her Most Gracious Majesty, in due recognition of his scientific work and his successful promotion of higher education.

With reference to the founding of the Royal Society of Canada, in a terse manner Sir William Dawson thus points out one of the objects for which this society was formed. "I would place here first," he says, in speaking of the ends which the society may seek to attain and the means of their attainment, "the establishment of a bond of union between the scat-

tered workers, now widely separated in different parts of the Dominion. Our men of science are so few, and our country so extensive, that it is difficult to find in any one place or within reasonable distance of each other, half a dozen active workers in science. There is thus great lack of sympathy and stimulus and of the discussion and interchange of ideas, which tend so much to correct as well as to encourage. The lonely worker finds his energies flag, and is drawn away by the pressure of more popular pursuits, while his notions become one-sided and inaccurate through want of friendly conflict with men of like powers and pursuits. Even if this society can meet but once a year, something may be done to remedy the evils of isolation. * * * Again means are lacking for the adequate publication of results. Transactions are published by some of the local societies, but the resources at the disposal of these bodies are altogether inadequate, and for anything extensive or costly, we have to seek means of publication abroad; but this can be secured only under special circumstances; and while the public results of Canadian science become so widely scattered as to be accessible with difficulty, much that would be of scientific value fails of adequate publication, more especially in the matter of illustrations. * * * Should this society have sufficient means placed at its disposal, to publish transactions equal in—I shall not say to those of the Royal Society of London—or the Smithsonian Institution at Washington—but to those of such bodies as the Philadelphia Academy or the Boston Society of Natural History, an incalculable stimulus would be given to science in Canada, by promoting research, by securing to this country the credit of the work done in it, by collecting the information now widely scattered, and by enabling scientific men abroad to learn what is being done here."

In the same year he was elected president of the American Association for the Advancement of Science, which body met in the city of Montreal, under the ægis of McGill University. It was in 1882 that the Peter Redpath museum of McGill University was inaugurated. The collections which adorn the main floors and galleries of this munificent gift of the man whose name it bears, were for the most part the result of personal labours and endeavours on the part of Sir William himself. By

dint of constant collecting wherever he went and a regular system of exchange by means of which he not only enriched the cabinets at McGill, but also made known Canada's geological resources to the world of science abroad, he obtained a vast quantity of material which is now exhibited in the Peter Redpath Museum.

In 1884 he was instrumental in bringing the British Association for the Advancement of Science to Canada, and two years later, he received the high distinction of president of that association. In 1893 he was elected fellow of the Geological Society of America, and in the same year he retired from the principalship of McGill University and was appointed emeritus principal and professor, also a governor's fellow and honorary curator of the Peter Redpath Museum. In 1895 the rare distinction of honorary fellowship of the Royal Society of England was conferred upon him. Sir William Dawson was also a corresponding fellow of the Geological Society of Edinburgh, a corresponding member of the Victoria Institute or Philosophical Society of Great Britain, a corresponding member of the Geological Society of France, of the Nova Scotian Institute of Science, Halifax, of the Montreal Microscopical Society, and he was also many years president of the Natural History Society of Montreal, which society he did much to bring to its present status in the world of science and research, and up to the past year was Honorary President of the same.

He was also member of many active bodies engaged in scientific pursuits throughout the world. He was also in touch with the various graduates' societies of McGill University throughout the length and breadth of this continent and was particularly happy when he found himself in the midst of a body of old graduates of McGill to whom he could speak of the past, present and future of the University for which he had laboured so faithfully and so long with such remarkable success.

In 1884 Sir William received the degree of LL. D. from the University of Edinburgh *honoris causa*.

Sir William was highly systematic in all the work he undertook and though his was a busy life, he was ever calm and collected with any amount of reserve force and energy at his back. He met even the humblest child with courtly grace,

generous spirit and dignity, commanding the respect and admiration of all those with whom he came into contact. He was a true friend of the student, he had the wonderful faculty of remembering faces and names so that even a student in the junior years he would recognize and salute first, wherever they met.

As an educationist, Sir William takes rank with the few who built up our educational institutions in Canada, and gave them a high character. From the early years of his career in Nova Scotia as superintendent of education until 1894 when he resigned the principalship of McGill University he never ceased to work in the interests and for the promotion of learning in the highest sense of the term. He sought in an effective and practical manner to give to the various classes of students under him the most advanced results of science, and research. Science education abroad occupied his attention and from the result of his observations and his knowledge of the needs and importance of practical science education, he applied the best methods of teaching in the university under his care. A careful study of methods of work, and teaching in the Royal School of Mines, the department of science and arts, London University, the Royal Institution, Owens College Manchester, science teaching in Cambridge and Oxford, and the movement in Edinburgh, in the Sheffield Scientific school, together with science teaching in the technical universities of Germany and Switzerland formed a subject of an important paper from his pen. Conscious of the want of science teaching in Canada, he was foremost in what was being done at Montreal in 1870 towards establishing the faculty of applied science at McGill, in those lines in which practical science training should fall.

Sir William was particularly happy when, out in the field with a class of students or with the members of the Natural History Society of Montreal on their annual excursions, he was engaged in examining the geological phenomena of the various localities visited, and instilling into his hearers the zeal of his enthusiasm. With what vigor and dexterity he wielded the hammer! His keen, penetrating eye and a sharp lookout for any rare species or new form of fossil organisms was very evident on all such occasions. He did much to foster and encourage the collection of specimens in all branches

of natural history. In all his teachings he was eminently practical and as may be seen from the large accumulation of material now displayed in the cabinets of the Peter Redpath museum he enlisted the co-operation of the students of the university both during and after their college career, and thus materially assisted in building up that monument of his industry.

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Sir William was the first librarian of McGill University, and in 1856 prepared a catalogue of the few books which constituted the library at that time and from this small beginning sought to bring together all the available volumes bearing on science and literature for the benefit of the students under his charge. During a recent visit to the Peter Redpath library of McGill University, the writer was shown the first series of volumes, actually the first book, to be catalogued by Sir William, under Class A, Number 1, of the Library of McGill College, Montreal. Mr. C. H. Gould, B. A., present librarian of the university pointed out that by a remarkable coincidence, "The Annual Register," Vol. 1 of which was the very first book catalogued by Sir William, was also the first to be catalogued in the new Peter Redpath library, from amongst the thousands of volumes donated by Peter Redpath, Esq., to the university.

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As a Bible student and expositor, Sir William stood high. He ploughed deep in the books of holy writ, and subjected those writings to the same keen, critical sense to which he referred various other problems in the scientific world, and brought out many hidden truths from the word of God, which had been hitherto obscure. "Egypt and the Holy Land, their geology and natural resources," "Eden Lost and Won," "Archæa," "The Mosaic Cosmogony," "Modern Science in Bible Lands," "The Origin of the World, According to Revelation and Science," form part of a series of writings of an apologetic character, which in his day, Sir William Dawson deemed necessary to combat certain views that were thrust upon the more or less observant and thinking world, regarding the origin of man as well as of other species living upon this planet. These have no doubt played a conspicuous part in estab-

lishing the present more or less evident equilibrium which exists in the thinking world regarding the relations which exist between our beliefs in religion as well as in science. They are two distinct spheres, and our earnest endeavours ought to be directed towards the perfection of our knowledge in one direction as well as the other, in order to satisfy these two sides at least of our nature.

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Simplicity and humility were the leading characteristics of Sir William Dawson's religious life. He was a member in full communion of Stanley Street Presbyterian church, and was appointed Commissioner to the General Assembly of the Presbyterian church in Canada on several occasions. He loved to worship with this quiet, retired congregation, where psalms and hymns were sung without instrumental accompaniment. For many years, he led in the Sunday School, and subsequently conducted a most successful class for teachers, which was composed of the teachers of the various Protestant denominations of Montreal. With every movement that had for an object the moral uplifting and bettering of the conditions of life in the Canadian metropolis his name was invariably connected, and in season and out of season, he never lost an opportunity of giving public expression to his keen sense of right and justice.

Here is an example of Sir William's writing showing his intense love for the 'right' and the 'truth', coupled with a hatred of the 'wrong' and injustice which needs supernal power to remedy.

"Surely man is the spoiled child of the Creator, allowed by an over-indulgent father to destroy the valuable things which he cannot appreciate, or which his own misconduct has rendered it necessary for him to apply to purposes not intended by the Maker either of man or of the lower things which he misuses. Surely it is the same indulgent Father, who causes His sun to shine on the evil and the good, and who provides a Saviour for the unworthy and the disobedient, though He is also a rewarder of those who diligently seek Him, and will not prevent the penalties of law whether physical or moral from falling on the reckless and impenitent. There is surely a latent gospel in nature, which has always been proclaimed in it,

though often to heedless ears, and which required the infinite knowledge and love of Jesus to interpret it clearly to us. No doubt this gospel like that of Christianity itself, is turned into gall and bitterness by modern pessimistic advocates of the mere struggle for existence; but to rightly constituted minds, Christ's interpretation is better, as it is also more happy and hopeful."

His was a well-spent life, unselfish in all its aims and purposes, unsparing in his efforts to advance the interests of his fellow citizens and of humanity in general, exercising withal, a power and influence for the moral good and welfare of all in a high degree. In the language of Socrates, regarding a well-spent life, we can truly say of his:—

"Καλὸν γὰρ τὸ ἄθλον, καὶ ἡ ἐλπίς μεγάλη"

"For noble is the prize and the hope is great."

As a writer, who sought to present in popular form the results of geological science to a larger audience than greeted him on the college benches, he was eminently successful. Among the most conspicuous of his popular writings in which the relations which exist between science and revelation were usually made a portion of his theme, the following may be mentioned: "The Story of the Earth and Man," "Facts and Fancies in Modern Science," "Fossil Men and their Modern Representatives," "Modern Ideas of Evolution," "The Meeting Place of Geology and History."

The many editions through which these various writings passed and the ready sale of his writings on both sides of the Atlantic, testified to their popularity. Throughout the English speaking world his name was a household word, and a letter of introduction was a passport in every country in Europe.

For a period of twenty-two years I was acquainted with Sir William Dawson. He had just completed twenty-two years at McGill, when I entered that University. Who could forget those precious evenings and hours spent in Sir William and Lady Dawson's company, both at home in the University hall, in the museum or geological laboratory. Those evenings especially were of a nature calculated to elevate and inspire. With microscopes, specimens and books, with illustrations of natural history objects, and a thousand and one objects of

beauty and interest in nature he sought to plant thoughts in the minds of his disciples, and interest them, or assist in developing their faculties of observation and comparison—those two great media of exact knowledge in science.

In the classroom, as a teacher, Sir William had few equals. From the time he entered the lecture room and punctually to the minute, he captivated the attention of his hearers by his wonderful flow of beautiful, descriptive language, coupled with the particularly happy faculty of graphically and accurately representing upon the blackboard in colored chalk, the various structures and illustrations in natural history, whether in botany, geology, zoology, or palæontology. It is currently reported that there are not less than ten persons now employed in the university, doing the work which fell to the lot of Sir William Dawson, during his tenure of office in the university from 1855-1894.

Besides his duties as principal and vice-chancellor of the university, member of the corporation, as well as chairman of the faculty of arts, he filled the chairs of chemistry, botany, zoology and geology, including mineralogy, ethnology and palæontology for many years, including both the ordinary course of lectures and the honour or advanced courses.

One of Sir William's strong points was the conciliatory nature of his arguments. He was always the broad-minded and many-sided man. He could see a thing in its all around aspect, and was ever calm and collected in what could scarcely even be called troublesome times.

Like all strong-minded men, Sir William had his foes, but withal, he always manifested a dignity of spirit, and unswerving love of truth, together with a strong tendency not to break away too suddenly from the well-known and rather conservative view of things; he went on in the even tenor of his way, usually carrying his point and leading his very opponents step by step to see the situation from his standpoint.

With the interest of the University at heart, imbued with a powerful and ever increasing faith in the constitution of the university of which he held the helm, with a far-seeing eye, he went on, determined to carry his points however far-reaching they might be.

Life with Sir William was a serious thing. It had with him

an earnestness and an increasing, ever active interest. He was both orderly and systematic. His own library, work-room and museum were models of order and neatness, and every minute of his life seems to have been occupied. When we consider the task which he accomplished—the University which he leaves behind him—the monuments which on every side on the college grounds are fruits of his skill and labour, tact and a hopeful nature, we appreciate the persuasive power which inspired confidence and won for him and the university scores of friends. All the students under him loved him. The wealthy merchants of Montreal, who came within the sphere of his influence (and he made it his business to instruct and inspire many of them in the ways of munificent donations to the University), recognized in him one in whom they could with all true confidence rely for judgement on the question of higher and practical education.

To those of us who have had the pleasure and privilege to listen to his marvelous flow of language, his lucid descriptions, as well as to those of us who have studied under him and who are now following up the science which he so dearly loved, and which he so generously imparted, with an inspiration and a zeal which but few masters possess, may it be said that we have caught something of the fire and earnestness of his life and spirit. When we see the results achieved during this useful life, to those who ask, we say:

"Si quaeris monumentum, circumspice."

His career as a scientist brought him in contact with all the leading scientists of the day, especially in the branches of botany, geology and palæontology. Between Sir Wm. Logan and Sir Wm. Dawson a strong friendship was formed. These two kindred spirits joined in advancing the interests of geological inquiry in Canada, and by their united writings, as well as by those of the late Elkanah Billings,—the palæontologist of the Geological Survey from 1856-1876—helped to make the name of Canada well-known in Europe, but more especially in the great centres of learning in London, Cambridge, Oxford, Edinburgh, Manchester, Birmingham, Liverpool and Glasgow.

With Sir Richard Owen he did much to make known the

early batrachians which inhabited our planet, and as mentioned before, he accompanied Sir Chas. Lyell on two occasions when the latter visited Canada.

With Jones, the Woodwards and Hinde, with Marsh, Claypole and Cope, with Lesquereux, Ward, Williams and Walcott, with all the members of the Geological Survey staffs of Canada, the United States and Britain, he was well acquainted. In France and in other portions of the Continent, his was a household name, and a letter of introduction or card from him carried in the hands of any of his former pupils, or friends, would be a passport to all scientific circles.

In 1893 a severe attack of pneumonia compelled Sir William Dawson to seek a warmer clime and he spent a portion of that year along the Florida coast. From this on he never regained his accustomed strength, and one day, while he was busily engaged in the Peter Redpath museum, he suddenly fell, a victim of a slight attack of apoplexy. Nevertheless, he gradually recovered, and whilst his bodily vigour was sensibly diminishing, his mental grasp of the various problems to be solved in Canadian geology was very marked. As late as July, 1899, in the course of a conversation that the writer had with Sir William, regarding difficult points in Nova Scotian geology, as well as the result of recent investigations carried on by a committee of the British Association for the Advancement of Science, on the pleistocene fauna and flora of Canada (of which he was chairman), he evinced remarkable strength of mind and clearness of judgment. This interview was followed by a long letter, in which Sir William pointed out in a masterly manner the various phases of the questions at issue, showing the full comprehension of the situation his mind still possessed. For the best part of two years Sir William was practically an invalid, and had to be carried or lifted from place to place, in all of which he evinced a calm resignation and faithful hope, which accompanied him and seemed to add even joy to those otherwise sad moments, until the final crisis and end came. "The gold of Ophir" and problems relating to it from recent discoveries made in South Africa, were occupying his attention only ten days previous to his demise.

On March 19, 1847, Sir William, then Mr. Dawson, was united in marriage with Miss Margaret A. Y. Mercer, Edin-

burgh, daughter of D. Mercer, Esq., of Edinburgh. There are five surviving children, the eldest of whom, Dr. George M. Dawson, C. M. G., F. R. S., &c., has followed the footsteps of his father, and given his life entirely to geological pursuits. He is now director of the Geological Survey of Canada, and is a Fellow or member of all the leading geological societies of North America and Europe. Mr. William Bell Dawson, a civil engineer, has charge of the tidal surveys of Canada in connection with the department of marine at Ottawa. Dr. Rankine Dawson, the youngest of the three sons, is now practicing medicine in London, England. The two daughters are Mrs. J. B. Harrington, wife of the professor of chemistry at McGill University, who did much to assist Sir William in illustrating various fossil organic remains which he described, and Mrs. Pope T. Atkin of Rock Ferry, near Birkenhead, England. Lady Dawson, who survives her husband and was his constant companion for upwards of fifty years, is entitled to great credit for the conspicuous part she played in seconding Sir William's efforts to promote the interests of the university and of guiding that wholesome influence of a true Christian home, which ever characterized their hospitable abode, to which many of us look back with pleasure.

To perpetuate the memory of Sir William Dawson in McGill University, to his already princely and munificent gifts, Sir William C. MacDonald of Montreal, Canada, has endowed the "Dawson Chair", the proceeds of which during her life are destined to Lady Dawson.

In March 1897, Sir William and Lady Dawson celebrated their golden wedding at Montreal, on which occasion they were made the recipients of numerous addresses of congratulation and messages from the graduates of the university and friends in general the world over, accompanied by souvenirs of the interesting event, which took place at their home, 293 University street, Montreal. On that occasion, there was a reunion of all the members and friends of Sir William's household, so that in his declining years, but two years previous to his departure from this life, he had the pleasure of witnessing an event which it is permitted only to a few in this world to celebrate.

I learn from good authority that Sir William Dawson has left behind him a large amount of material, notes, papers, correspondence, and documents relative to the university, with a view of preparing a history of that institution of learning. It is to be hoped that before long these will fall into the hands of a competent person, who will prepare this work which the late lamented principal no doubt expected to complete. It would add one more tribute to the memory of him who did so much to build up that centre of excellen^t, practical education.

HIS WRITINGS.

The following paragraph constituting a portion of the preface to his "Airbreathers of the Coal-Period: a descriptive account of the remains of Land Animals found in the Coal formation of Nova Scotia with remarks on their bearing on theories of the formation of Coal and of the Origin of Species." issued in 1863, gives the reader an excellent insight into Sir William Dawson's method of work as well as his motive in issuing such a work. "A certain moral obligation," he writes, "rests on the discoverer or possessor of new and valuable fossils to make them known as extensively as possible to the scientific world. This he may do either personally or by the aid of others more conversant with the class of objects in question. I have generally preferred the latter course for all objects not included in my own special lines of investigation; and in the case of the subjects of the present brochure have presented them, as discovered, to the investigation of naturalists specially engaged in the study of such remains. * * *

Hence the present publication, in which I give a summary of all that I have been able to ascertain of the land animals of the Coal Period in Nova Scotia and endeavour to make my collection of their fossil remains the common property of all geologists and naturalists and thereby discharging the obligations under which I am laid by having had these precious relics placed by Providence in my hands."

"*On Eozoon.*" Possibly none of Sir William Dawson's writings brought him into greater prominence than those on Eozoon Cana-

dense from the Laurentian rocks of Canada. From the time when he first described this supposed organism from the then recognized metamorphic sedimentary rocks forming the original or oldest portion of the crust of our earth, as developed in Canada, a great interest was aroused the world over with respect to this discovery placed in his hands by Sir William E. Logan, first director of the Geological Survey of Canada, who, also with Dr. T. Sterry Hunt, believed firmly in its organic origin. Ever since that time a live and unabated discussion has arisen in which some of the keenest and most pungent arguments ever used in scientific controversies were employed. A flood of light upon and a decided impetus in the search after the earliest forms of organisms which inhabited our planet has followed these discussions. Whether or not we believe in the organic origin of *Eozoon Canadense*, of *E. Bavaricum*, or of *E. Bohemicum*, as firmly as the subject of this sketch, in this much we must agree, namely, that Sir William Dawson has presented a strong case for his species and his minute and careful descriptions bear the stamp of close study of a large and important series of specimens. The fact that men like Carpenter, Dana, Murie, Logan, Hunt, Zittel, for a long time accepted Sir William's views is evident proof of his influence as a writer.

It is to be hoped that there will be no cessation in the interest taken in ascertaining what are the "relics of primæval life," what the conditions in which they lived and what their relations to organisms we know well, whose organic origin is not questioned.

On Fossil Plants. Sir William Dawson's memory will ever be cherished in the field of palæobotanical research as one of its pioneers who did much to make the oldest floras of the world known to his day and generation both from a scientific and from a popular standpoint. He was no mean botanist and in his treatment of palæozoic or primary as well as of later Mesozoic or secondary floras he displayed a wide knowledge not only of the floras of those epochs previously described from both continents, but also of their relations to each other and of their successors in the Tertiary and even later Quaternary floras in Canada, which he made known.

His "Geological History of Plants" is an excellent work of reference; so also are his studies on "Palæozoic Gymnosperms" and his numerous papers on Canadian Mesozoic and Tertiary floras of British Columbia and the North West Territories.

On Education. These are varied and in them the master mind is ever present, that of one who grasps the situation at a glance, plans

for the present as well as plants for the future and carries out a well-ordered and systematic theory to a practical issue. Sir William has done much to promote education in Canada. First, in Nova Scotia, his native province, he laboured very successfully and laid the foundation of the system now in vogue. In New Brunswick he did not a little to place the university (King's College of that period) on a satisfactory basis.

Then in Montreal at McGill he had just sufficient opposition to introduce his masterly and long sighted principles into effect to stimulate him to greater activity. He lived to see that centre of education rise to an eminence in the world. But, his earnest and best endeavours were to make men, to educate them and lead them into paths of usefulness and with a view of enjoying to a full extent all the composite powers of one's being, including the physical, mental and moral as well as spiritual.

On Science and Religion. Sir William was a devoutly religious man. His private as well as his public life both bore testimony to his inward faith. He sought to apply the scientific method in the interpretation of many otherwise obscure passages of Holy Writ and by his numerous writings on this subject certainly drew attention to many points of world-wide interest and his interpretations were, as a rule, simple, natural and effective.

He saw in the great book of Nature a Divine Hand. In Holy Writ he accepted the Divine inscription and with the faith of a child uttered its great truths in a simple manner. These writings of his were very popular, some of his books covering eleven editions.

On page 285 of "*Recent discussions of the first chapter of Genesis*," Sir William makes what may be considered an apology for writing upon this theme. "The present writer is not a theologian, or a divine" he writes, "but simply a naturalist, whose specialties have lain in some departments of palæontology, and who has studied the Hebrew Sacred writings partly as a means of knowing something of Semitic language and literature, and partly because of their practical connection with "Christianity."

His conception of the relative values to be attached to researches in cosmogony, the philosophy of geology, or in studies regarding the origin and migration as well as succession of the various orders of plants and animals which inhabited this globe, is well illustrated in the following paragraph on page 234 of the work just cited above. "It would be a "strange phenomenon in the intellectual life of our time that some of

"our ablest men should be found contending earnestly as to the meaning and validity of a document so old as the proem to Genesis, were it not that, as Mr. Gladstone has so well put the matter, this constitutes "the opening section of a book in which is conveyed special knowledge "to meet 'the special need everywhere so palpable in the state and "history of our race.' In face of this special need, it is true that questions of cosmogony, or of the origin of the lower animals, become small "and unimportant, yet these bulk more largely in our estimation when "we find them to be subsidiary in even a small measure to the greater "questions that relate to the early history and destiny of man."

On Microsauria. The researches carried on by Sir William Dawson in fossil tree trunks in the famous Joggins Shore section in Nova Scotia and his writings thereon have gained for him also world-wide fame and credit. The patience and perseverance, so eminently characteristic of the man, is displayed in this painstaking task. No amount of trouble was taken to arrive at as complete a knowledge of the "Air-breathers of Nova Scotia" as he could by dint of hammering at these old fossil tree trunks where the reptiles of the period, insects and various other land creatures had lodged while in a decaying or decayed condition. Some of Sir William's best and most lasting work is in this respect and he has done much to make these formerly unknown animals of the Carboniferous period well-known to all naturalists

Manuals and Handbooks. True to the instincts of a teacher, of a master, Sir William wrote manuals for students. His first text book was one devoted to Scientific Agriculture for schools in Nova Scotia. That fertile province even to-day needs to put into practice the principles enunciated in his most recent treatise on this subject as taught in the Normal and Model Schools at Montreal and in the Province of Quebec generally. His Manual of Zoology for Canadian students is indispensable to all working Naturalists. Forms found living on the land and in the waters (salt and fresh) of Canada, or in a fossilized and petrified condition in the strata of the Earth's Crust in Canada are therein described and recorded, together with general views of the classification of the Animal Kingdom. His manuals on geology for the use of students and his famous "Acadian Geology" form the most complete treatises we possess, giving an abstract of Canadian geological nomenclature and classification.

In conclusion, I desire to acknowledge with sincere thanks the valuable assistance received in the preparation of this brief biographical notice and of the accompanying list of the writings of Sir William Dawson, from the following:—Dr. George M. Dawson, Director of the Geological Survey of Canada; Hon. C. D. Walcott, Director of the U. S. Geological Survey and the energetic and painstaking librarian of that institution, Mr. Charles Darwin; Dr. Merrill, Prof. Lester F. Ward and David White, and Prof. Theodore Gill, of Washington, D. C.; Dr. Ernest Richardson, Librarian of Princeton University, New Jersey; Sir John G. Bourinot, Hon. Sec. of the Royal Society of Canada, Ottawa; Dr. E. O. Hovey, of the American Museum of Natural History, New York City; Dr. A. H. Mackay, Superintendent of Education for Nova Scotia, Halifax; Prof. D. P. Penhallow, McGill University, Montreal; Mr. Martin J. Griffin, Library of Parliament, Ottawa; Augustus Lowell, Esq., Boston, Mass.; Dr. W. P. Cutter, Dept. of Agriculture, Washington, D. C.; Capt. F. Petrie, Librarian and editor, of the Victoria Institute, London, Eng.; Dr. B. J. Harrington; and Mr. C. H. Gould, B. A., of the Peter Redpath Library, Montreal; also from the various sources which have furnished data in the preparation of this small tribute to the memory of my master and friend.

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