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DESCRIPTIONS OF FOUR NEW SPECIES OF FOSSILS
FROM THE SILURIAN ROCKS OF THE SOUTH
EASTERN PORTION OF THE DISTRICT
OF SASKATCHEWAN.¹

By J. F. WHITEAVES.

(With Plate III.)

While engaged in explorations on behalf of the Geological Survey of Canada in 1889 and 1890, Mr. J. B. Tyrrell discovered an area of Silurian (Upper Silurian) rocks on the north east side of Lake Winnipegosis, on Cedar Lake, and on the Saskatchewan River below Cedar Lake. From these rocks an interesting series of fossils was obtained, some of which are apparently new to science, and of these latter, four of the most characteristic or important species will be described and illustrated in the present paper. On stratigraphical and other grounds, Mr. Tyrrell has found it desirable to divide the Silurian of this district into two local subdivisions. The fossils here described will be considered in the order of their geological relations, but it may be well to state that the *Pentamerus* and *Gomphoceras* are from the

¹ Communicated by permission of the Director of the Geological Survey of Canada.

THE ROYAL SOCIETY OF CANADA.

By JOHN READE, A.M.

The Royal Society of Canada owes its existence to the thoughtful interest of Lord Lorne in the intellectual progress of Canada. The movement out of which its organization arose was inaugurated in 1881. Already its enlightened founder had established a Canadian Academy of Arts, for the encouragement of design as applied to painting, sculpture, architecture, engraving and the industrial arts, and the promotion and support of art education. The success which had attended the formation and early proceedings of the institution led his Lordship to believe that a national organization which would be to science and literature what the Academy was to art would be of real service to the cause of the higher intellectual culture in the Dominion. After consulting with the leading men of science and letters, both French and English, his Lordship invited the gentlemen whom he had designated as provisional officers of the proposed organization to meet in Montreal. The meeting accordingly took place on the 29th and 30th of December, 1881, and thereat a memorandum from Lord Lorne on the subject was read and considered.

A provisional basis was then agreed upon for the constitution of the new society, the first meeting of which took place at Ottawa on the 25th of May, 1882. The Governor General (Lord Lorne) had invited the members of the provisional council to Government House for the settlement of the procedure, and the arrangements proved entirely satisfactory. The Council consisted of Principal (now Sir) J. W. Dawson, C.M.G., LL.D., F.R.S., President; the Hon. P. J. O. Chauveau, LL.D., Docteur des Lettres, Vice-President; and the Presidents and Vice-Presidents of sections: J. M. LeMoine, Esq., and Faucher de St. Maurice, Esq., first section; Dr. (now Sir) Daniel Wilson, F.R.S.E., and Goldwin Smith, Esq., D.C.L., second section; Dr. T. Sterry

Hunt, F.R.S., and Charles Carpmael, Esq., third section, and Dr. A. R. C. Selwyn, F.R.S., and Dr. George Lawson, Ph.D., fourth section; J. G. Bourinot, Esq., F.S.S., Honorary Secretary. All these members of Council were present except Dr. Goldwin Smith, then absent in England.

At the general business meeting, held in the railway committee room, Parliament Building, Ottawa, on the morning of the 25th of May, the Honorary Secretary read the Council report, the recommendations of which were afterwards embodied in the charter and constitution of the Society. The formal public inauguration of the Society took place in the Senate Chamber, at 4 o'clock in the afternoon. Members of the Society having been presented to the noble Founder, His Excellency set forth the aims of the Society, and expressed the hope that its formation would promote the intellectual development of the Dominion in the higher ranges of thought, letters and research. "Improvements," said his Lordship, "there must necessarily be at first in its constitution—omissions in its membership and organization there may be. Such faults may be hereafter avoided. Our countrymen will recognize that in a body of gentlemen drawn from all our provinces and conspicuous for their ability there will be a centre around which to rally. They will see that the welfare and strength of growth of this association shall be impeded by no small jealousies, no carping spirit of detraction, but shall be nourished by a noble motive common to the citizens of the republic of letters and to the students of the free world of nature, namely, the desire to prove that their land is not insensible to the glory which springs from numbering among its sons those whose success will become the heritage of mankind.

The President, in his address, mentioned some of the reasons which, in his opinion, justified the institution of such a body in Canada. If the idea had been broached in the past, it had been abandoned owing to obvious difficul-

ties. But it had at last presented itself under happier conditions which gave fair hopes of success. It was fitting that the representative of a Sovereign, whose rule had been so favorable to culture and research in the United Kingdom, would show himself the patron of letters and science in the new world. The time, moreover, was auspicious. Political consolidation had been drawing nearer to each other the once scattered and isolated scientific workers of the North American provinces. Such a society would be to them a bond of union and sympathy, and by the interchange of ideas would supply a needed stimulus to men of kindred pursuits. It would, by the publication of its Transactions, be of incalculable benefit to Canadian naturalists, hitherto so largely dependent on foreign aid for placing the results of their labors, in a worthy form, before the world. As a centre of literary and scientific effort, it would, without interfering with the claims of older local societies, be of very real help to them. Comparing Canada with other countries, the President thought it was rather matter for surprise that so many persons amongst us had won distinction in the paths of research and of letters than that there were not more. Finally he spoke of the great responsibility of the members, and he hoped that by earnest and united effort they would prove themselves deserving of the name to which they aspired. The Vice-President set forth in French, with his customary grace, of style, the intellectual progress that Canada had already achieved, dwelling especially on its literary, as Dr. Dawson had dwelt on its scientific aspects. He trusted that the Royal Society would prove a common meeting ground not only for scientific and literary workers, but also for the culture of the two great races whose lot was cast together in this broad Dominion.

The Society then separated into sections. Fifty-six papers, embracing nearly all the departments of research, were either read or presented at the first meeting, and of these thirty-three were published in the Transactions. Re-

ferring a year later to the general results of the meeting Sir William Dawson was able to express a high degree of satisfaction at what had so far been accomplished. "We have occasion," he said, "to congratulate ourselves on the reception which our inaugural meeting met with at the hands of the public and the newspaper press. Everywhere the institution of the Society was recognized as wise and beneficial, and if any doubts were expressed with reference to it, they were based not on hostility to the Society, but on a very natural diffidence as to the capacity of Canada, in its present state of development, to sustain a body comparable with the great national societies of other countries. The amount of original work produced at our first meeting was evidently an agreeable surprise to many; and while there was some friendly criticism by which we may hope to profit, on the whole our debut was regarded with that feeling at once kindly, considerate and patriotic which becomes all true Canadians in witnessing any effort, however feeble, to sustain and exalt the greatness of our country."

Meanwhile the Society had obtained the recognition of the Queen and of the Canadian Parliament. A letter from Lord Kimberley, Secretary of State for the Colonies, dated the 22nd of August, 1882, to the Marquis of Lorne, gave the pleasing information that Her Majesty had graciously permitted the Society to be styled "The Royal Society of Canada." On the 1st of March, 1883, a Bill to incorporate the Society was introduced in the House of Commons by Mr. Tassé. It was read a second time on the 19th of the same month, and on the 6th of April it was considered in committee, read a third time and passed. It received the royal assent on the 25th of May.

Rule 11, regarding the affiliation of local literary and scientific societies throughout the Dominion, has proved most fruitful in concentrating and developing the intellectual efforts of all the provinces of the Dominion. In

1883 twelve societies responded to the Hon. Secretary's invitation by sending delegates. This number has increased from year to year, until now there are altogether twenty-four literary, scientific, philosophical and historical societies represented in the Transactions. The full reports of their proceedings submitted by these organizations of kindred aim are extremely valuable, as indicating the work that Canada is doing in the various fields of scientific research, historical investigation and literary creation or criticism. Some of the delegates have contributed records covering the whole period of their society's existence—records of undoubted interest and value to the future historian of our intellectual progress. The following is a list, in the order of their seniority, of these

AFFILIATED SOCIETIES.

Literary and Historical Society of Quebec	1824
Natural History Society of Montreal.....	1827
(Incorporated, 1832.)	
Institut Canadien, Quebec	1846
Canadian Institute, Toronto.....	1851
Institut Canadien, Ottawa.....	1852
Hamilton Association, Hamilton.....	1856
Société Historique, Montreal.....	1858
Nova Scotia Inst. Natural Science.....	1862
Natural History Society, New Brunswick.....	1862
Numismatic and Antiquarian Society, Montreal.....	1862
Entomological Society of Ontario.....	1863
Ottawa Literary and Scientific Society.....	1869
Murchison Scientific Society, Belleville.....	1873
Nova Scotia Historical Society.....	1878
Ottawa Field and Naturalists' Club.....	1879
Geographical Society of Quebec.....	1879
Historical and Scientific Society of Manitoba.....	1879
Society for Historical Studies, Montreal.....	1885
Cercle Littéraire Français, Montreal.....	1885
Cercle A. B. C. (Philosophical), Ottawa.....	1886
Canadian Society of Civil Engineers.....	1888
Wentworth Historical Society, Hamilton.....	1888
Society of Canadian Literature.....	1889
Natural History Society of British Columbia, Victoria.....	1889

Though the work the sections can hardly be said to have been fairly divided, some members contributing much more than others, while of a certain number the names have been conspicuous by their absence from the yearly programmes; it may, on the whole, be said that the promise of the opening session has been fulfilled in the successive meetings of the last eight years. In their chosen branches of study and research, all the four sections have added not a little to the sum of the world's knowledge, and if this total be enlarged by the aggregate of work done by the affiliated societies, the whole makes an intellectual product of which the Dominion has no reason to be ashamed.

The points most criticized in the constitution of the Society were the combination of science and literature and its bi-lingual character. As to the former, the first President took occasion, in the address already quoted from, to show that, instead of being a drawback, it was an advantage. After indicating the close relations between the two departments of intellectual effort, he thus expressed his satisfaction at the Society's comprehensiveness:—"For these reasons I rejoice that our Society embraces both science and letters, and I am profoundly convinced that it is for the highest interest of Canada that her scientific men shall be men of culture, and that her literary men shall be thoroughly imbued with scientific knowledge and scientific habits of thought." In a paper read before the Society on the relation of such bodies to the State, the late Dr. Todd showed that New South Wales had anticipated Canada by forming a Royal Society on the like broad basis, its avowed object being "the encouragement of studies and investigations in science, art, literature and philosophy." Lord Lansdowne also expressed his satisfaction at its twofold division, which, he said, greatly enhanced the interest and value of the Transactions.

As to the other point which was the subject of discussion—the union of French and English-speaking members—

so far from proving an obstacle to the Society's usefulness, it has been one of its most fruitful features. The French and English sections have, by their harmony and good-will, set an example which the whole Dominion might follow with advantage. Differences of race and creed have been revealed only by mutual courtesy and willing co-operation in the grand aims of the Society. From the rule of kindness and deference there has been, from the opening of the first to the closing of the last meeting, no instance of departure. It is also noteworthy that the Society has been the means of renewing relations between the two branches of the French race in the new world—that of Canada and Acadia, and that of Louisiana—the *Athénée Louisianais* of New Orleans, being one of the first of foreign organizations to respond to the invitation of the Honorary Secretary. In the list of the corresponding members, moreover, eminent sons of the French race have their places along with illustrious Anglo-Saxons of both hemispheres. Had the Society effected nothing else than these exchanges of cordial sympathy, it would not have lived altogether in vain.

The letters from eminent foreign societies which greeted the entrance of Canada into their illustrious sisterhood were most gratifying. M. Camille Doucet, perpetual secretary of the French Academy, in acknowledging the Hon. Secretary's invitation to the Institute of France to send a delegate to the meeting at Ottawa, said that Dr. Bourinot's letter had been received with the most cordial sympathy by each of the five Academies that constitute that great centre of universal learning.

The circulation of the Transactions has done much to make Canada better known at the chief seats of enlightenment in the Old World. "Not a week passes, says the report of the Council for 1887, "without some evidence being furnished of the attention that the papers are receiving in cultivated circles abroad, and requests for the volumes are constantly at hand from various centres of intelligence to

which they have not hitherto been sent. Only a fortnight ago, for instance, the Hon. Secretary received some very interesting volumes from the Imperial University of Japan, at Tokio, with an expression of the wish that the Transactions should be regularly sent to that institution." More than six hundred copies are thus distributed every year, and that they do not lie unread on dusty shelves is shown by the best of evidence—the extent to which they are quoted in works dealing with the themes of which they treat.

Apart from its relations to the centres of learning and research in other lands, and its attractive potency on the scattered circles of local intellectual effort in the Dominion, the Royal Society plays a not unimportant rôle in connection with the State. This phase of its usefulness (which has hardly yet, perhaps, been allotted due significance) was very clearly illustrated in a paper read by the late Dr. Alpheus Todd, C.M.G., before the Society not long before his death. Citing the example of New South Wales, which was the first of the British Colonies to establish a Royal Society, he commended the statesmen of that great country for availing themselves of the co-operation of learned and capable advisers to advance the public welfare in matters that lay distinctly apart from the domain of party politics. In so doing, however, they were simply following the precedent of the motherland, which had long assigned to the Royal Society of London certain duties of a scientific nature which it was peculiarly qualified to discharge. The application of the same principle in Canada was a logical sequel of the formation of such a body. The same subject was very appositely though indirectly treated by the first President in his second address (1883), wherein he outlined the progress already achieved mainly through the Geological and Natural History Survey and the provisions for science teaching in the Universities. A perceptible stimulus was given to the scientific movement in Canada, both in its practical and scientific aspect, by the departure of the Bri-

tish Association from its narrower early traditions in consenting to hold a meeting in Montreal. In that meeting (1884) members of Canada's Royal Society took an active part, and among the subjects which they chose for their papers there were several which had a distinct relation to the State—such as those on Standard Time, on Tidal Observations on Canadian Waters, on our Mineral Resources, on various branches and details of economic science, and on questions pertaining to our native races.

But, in reality, it is not occasionally but always that the Royal Society is, in sympathy, aspiration and the sphere of its labors, in close relation to the State and the needs of the country at large. Such relation arises necessarily from the fact that the membership of the scientific sections is so largely composed of officers of the scientific departments of the Government. The head of the Geological Survey and the principal members of his staff, the Surveyor-General, the director of the Experimental Farms, the chief Analyst, the head of the Meteorological Service, the director of State Telegraphs, the Government Entomologist, more than one *emeritus* official of high standing, and the several members of corresponding services in the provinces—these, with representatives of the Universities occasionally employed in public functions, form a sort of State Council on the whole range of important questions in which scientific knowledge and experience are essential to the general welfare. An examination of the contents of the Transactions for any and every year will, in fine, furnish convincing proof of the alliance between the Royal Society and the State, and of the benefits which the former renders to the latter.