

act was finally renewed with the same provisions. In the same year the Government decided to send a collection of Canadian economic minerals to the first of the great International Exhibitions in London, inaugurated by Prince Albert. This collection was prepared and placed in the charge of Mr. Logan, who by-the-way during his stay in London, was called upon to defray his own expenses. The exhibit, which obtained a medal, came in for a great deal of notice and praise, the *Times* referring to it as the most interesting and the most complete of all the collections sent from the British Colonies. While in London, Logan was elected a Fellow of the Royal Society. Up to this time actual geological investigations and examinations had been conducted in the mineral bearing districts of Lake Superior, Lake Huron, their coasts and islands; the Huron-Erie Peninsula; the Ottawa river valley; the Eastern Townships from the Richelieu to the Chaudière; in the St. Lawrence valley, the Island of Anticosti; the Gaspé Peninsula; the north shore of the St. Lawrence for a considerable distance east and west from Montreal and the country between Lake Simcoe and Kingston. By way of contrast it may be noted that whereas in 1857 geological work in Canada—a country then comprising 331,280 square miles—was being undertaken by a staff of two geologists and a chemist, in the State of New York whose area is about 46,200 square miles, a geological staff was employed including four geologists, four assistant geologists and a palæontologist; with an annual grant of £2,000 as against one of \$20,000, exclusive of the cost of publications.

In 1854, in consequence of a popular demand that steps should be taken to give a wider circulation to the valuable reports and publications of the Survey and thus make them more generally accessible to the public, a select committee on the Geological Survey was appointed by the Government. The evidence before this committee of Messrs. Logan and Hunt, and of other distinguished witnesses, namely: Prof. James Hall, of the New York Survey; Prof. E. J. Chapman, of University College, Toronto; Mr. Alexander Russell, of the Department of Crown Lands; the Rev. Andrew Bell, of L'Orignal; Prof. Horan, of Quebec, and of Prof. Agassiz, makes very interesting reading and was of a highly complimentary character, but referred to the difficulties under which the survey was working.

Notwithstanding the generally favorable impression which Logan and his work had made upon the people of Canada, there must have been some who were still skeptical as to the advantages which the country would derive from the Geological Survey. The Committee, therefore, did not fail to interrogate Logan closely on this subject. "Can you," they asked, "give any illustration of the manner in which a sound scientific basis leads to practical economical results?" and again, "Have you in your survey as your principal object the establishment of new scientific facts, or has your attention been directed to discovery and pointing out economic advantages?" From Logan's answers to these questions we make the following extracts.

"The object of the survey is to ascertain the mineral resources of the country and this is kept steadily in view. Whatever new scientific facts have resulted from it have come out in the course of what I conceive to be economic researches carried on in a scientific way. . . . Thus economics lead to science and science to economics. The physical structure of the area examined is, of course, especially attended to, as it is by means of it that the range or distribution of

useful materials, both discovered and to be discovered, can be made intelligible. A strict attention to fossils is essential in ascertaining the physical structure. . . I do not describe fossils but I use them. They are geological friends who direct me in the way to what is valuable. One of them who is not yet specifically baptized, helped us last year to trace out upwards of fifty miles of hydraulic limestone. . . . My whole connection with geology is of a practical character. I am by profession a miner and a metallurgist. A due regard to my own interests forced me into the practice of geology, and it was more particularly to the economic bearings of the science that my attention was devoted."

After hearing the evidence, the committee made the following recommendations:

- (1) Republication of a revised edition of not less than 20,000 copies of the reports, with a coloured map.
- (2) Publication of the same number of annual reports in future years.
- (3) The periodical publication of 3,000 copies of plates and descriptions of fossils, etc.
- (4) Gratuitous distribution of reports in certain directions and the remainder to be sold at cost price.
- (5) Establishment and maintenance of the museum and library upon an efficient footing.
- (6) To provide for the supply of geological and mineralogical specimens to other museums.
- (7) The employment of topographical surveyors and their parties to assist in the geological surveys, when judged necessary.
- (8) The employment of two or three additional explorers.
- (9) The employment of a resident assistant, as keeper of the museum, and in the general business of the office.
- (10) The employment of a second assistant geologist, charged more especially with the exploration of mineral localities. (But to this the rider is added: "The committee wish it to be understood that in the present state of the country they consider this the least essential addition to the establishment, and unless ample funds are provided, they would not advise it, to the prejudice of any other of their recommendations.")
- (11) The encouragement of voluntary assistance by the publication of questions and short instructions now and what to observe and collect.
- (12) Securing the aid of deputy provincial surveyors, and requiring candidates in the future to pass an examination in the rudiments of geology.
- (13) The establishments of certain points in different parts of the country, as a basis from which local surveys may be reckoned.
- (14) Requiring railway companies to furnish plans and sections of their surveys.

Accompanying these recommendations an estimate was furnished, in which the annual cost of the Department was placed at \$6,000.

At the Paris Exhibition of 1855 Canada's collection of minerals, in the charge of Messrs. Logan and Hunt, was very highly commended, and for his services in this regard Logan was awarded a gold medal and presented by the French Emperor with the cross of the Legion of Honour, and in the following year, Her Majesty conferred on him the honour of Knighthood, and the Geological Society bestowed on him the Wollaston Medal, as a sign of their appreciation of his work. On his return to Canada the Geological Act of 1850 had expired, and doubtless apart from the findings of the select committees, the honour shown to Sir William while abroad and the influence he personally exerted upon his return, was to no small de-