

they reached Usamboro, and Mr. Mackay's kind reception, his influence over the natives, who trusted and loved him, and the sincere sorrow with which he had heard of his death. Enclosed in the letter was a cheque for £60 from the Countess of Noailles to erect a cross over Mackay's grave at Usamboro, with an inscription in Arabic, Swahili and English.

Wherever English institutions prevail, the traditional formula, "King or Queen, Lords and Commons," seems to be regarded as the *sine qua non* of legislative efficiency. All over the Empire (with rare exceptions) it has been taken as the almost obligatory model of a Parliament. The United States, following the traditions of the Mother Country, adopted the principle of an Upper House. In all constitutionally-governed countries we find it observed as *de rigueur*, it being almost universally accepted that a parliament must consist of two chambers. Mr. Gladstone calls this division of the legislative power into three branches, the *arcanum imperii*, and, indeed, it was so regarded long before his time. But that it is essential, even in England, there are those who deny. Mr. Gladstone considers the House of Lords a great power in the State. It may cause embarrassment to an administration, still its vote cannot deal it a fatal blow. On the confidence of the House of Commons, or the other hand, the ministry is dependent, and that House is the greatest power recognized by the British Constitution. From its judgment the only appeal is to the nation. Could the Upper House, then, be dispensed with? Whatever may be the case in Great Britain, experience has shown that in Canada the business of legislation may be efficiently conducted with a single (that is, the popular) Chamber. Mr. Rochon, in moving the second reading of his bill for the abolition of the Legislative Council in this Province, pointed to Ontario, and the example sufficed to illustrate his argument. His colleagues, however, with the exception of fifteen, left the solution of the question to the Government, 41 voting for Mr. Desmarais' amendment in that sense.

#### EXPERIMENTAL STATIONS.

The first report of the experimental station established in this Province is published in the last report of the Commissioner of Agriculture and Colonization. The Central and other experimental farms organized by the Dominion Government have been in operation for some years, and are doing a good work. The movement originated in the recommendation of a Select Committee appointed by the House of Commons in January, 1884, to obtain information as to the agricultural interests of Canada and the best means of encouraging and developing them. The committee took the evidence of a large number of persons, most of whom were experts in one or other branch, or in several branches, of agriculture. A series of questions covering the whole ground of the investigations which the committee had undertaken was addressed to persons likely to have data of value at their disposal, and nearly 400 replies were received. Deficiencies were pointed out in the cultivation of cereals and vegetables, in fruit-growing, in stock-raising and dairying, in the selection of seeds, in the use of fertilizers and in other important respects, and it was the opinion of the most enlightened and experienced of the witnesses that the establishment of a Central Bureau, under the direction of a superintendent, with a trained staff of specialists to assist him, would be the best plan for the systematic collection and dissemination of accurate knowledge on those points in which Canadian farmers had shown most backwardness. The Government lost no time in turning to account the recommendations of the committee, and a Central Experimental Farm was established in the neighbourhood of Ottawa and placed in charge of Mr. William Saunders, F.R.S.C. It is now thoroughly equipped, and has, since its inauguration in the spring of 1887, been the means of accomplishing a large amount of good in the Dominion. There are associated with the director, Mr. Saunders, a chemist, an entomologist and botanist, a horticulturist and a poultry manager. Our farmers

have been gradually learning that, by applying to the director, they are sure of receiving information and advice on any matter as to which they may be in doubt. During the last year, as appears by the published report, 6,864 letters were addressed to the director or some of his staff, and 5,428 were dispatched from his establishment. Pamphlets, including reports and bulletins, to the number of 41,584, and 3,662 packages of grains and seeds were also mailed in all directions. The enquiries are on all sorts of subjects connected with the operation of a farm. It is well that none of our farmers should be in ignorance of such a source of information, and that those who know of its existence should avail themselves of its advantages at a time like the present, when a good many seem to be perplexed as to the best crops or stock to raise and the most profitable manner of raising them and disposing of the surplus.

Besides the Central Farm, there are farms at Nappan, N.S., at Brandon, Manitoba (an illustrated account of which has appeared in this paper), and at Indian Head, N.W.T. A farm was also started at Agassiz, British Columbia, in August last year, so that there are now four of these farms in working order; in addition to the Central Farm at Ottawa. The report of the progress made at these provincial institutions is encouraging. Though each of them is under its own superintendent or manager, they are all subject to the supervision and direction of Mr. Saunders. The Central Farm is the model for the provincial stations, just as they are models and centres of information for the agricultural communities in the provinces. Mr. Saunders has also a general oversight over the farming industry throughout the Dominion, making reports on the districts he visits and offering suggestions to the agricultural societies and *cercles agricoles*. The Central Farm is indeed, a sort of headquarters of intercommunication for all the general and special agricultural societies and agencies throughout the Dominion, whether they are of a comprehensive character, or are devoted to stock-raising, dairying, horticulture, wool-growing, poultry-raising, or any other special industry. The experiments conducted comprise tests of wheat, barley, oats, Indian corn and other cereals, peas, vegetables and fruits, of various breeds of horses, cattle and other live stock, analyses of soils, trials of fertilizers, the description of insects, noxious and useful, and the modes of dealing with the former; of birds, with indications of their serviceableness or hurtfulness to the farmer's property; the planting of fruit and other trees suitable to our latitudes, and especially their naturalization in the denuded regions of the North-West.

The experimental station established at St. Hyacinthe is, as already indicated, under the control of the Commissioner of Agriculture and Colonization of the Province of Quebec. The law to which it owes its existence was passed in 1888. It has a chemical laboratory attached to it, in which analyses of soils, cereals, ensilage, milk, etc., are made. It began operations in July, 1889, when it was placed in charge of the College of St. Hyacinthe. The laboratory was ready in September and the director at once began work. There has also been since last spring a small experimental garden for the testing of seeds, fertilizers, etc. Four subjects have especially engaged the attention of the director, Mr. C. P. Choquette—ensilage of Indian corn, chemical fertilizers, ashes of forest trees, and milk. Of the analyses in all these cases full reports are given, with particulars as to the sources whence the samples were obtained and the circumstances of their production. The ensilage report is extremely interesting, showing under what conditions corn yields low and high nutrient values, and giving advice as to sowing and the distance between the rows. Our object at present, however, is not to quote results but to insist on the advisability of our farmers availing themselves of these institutions. There has been much discussion of late as to the renewal in this province of the attempt to raise beets for the manufacture of sugar, and it is more than likely that it will be made. But it is indispensable at the outset that the farmers be carefully instructed in the proper

method of beet-growing, or the failure also will be repeated. Whoever has read Mr. Wilfrid Skaife's paper on sugar-producing plants and the mode of cultivation in Bohemia, where he served his apprenticeship to the business, will have no trouble in discovering where the fault in this province has lain. This is just one of those points in which the experimental stations should be of benefit, and it would be well if the proper department directed attention to the need of both precept and example before the *habitant* is asked to invest his time and means in the industry. Many inquiries have of late been made as to the respective values (in the English market especially) of the different varieties of wheat. On this point, also, the tests already obtained should be made widely known.



#### MY CLASS IN GEOMETRY.\*

Some of our readers have doubtless studied a posthumously published work of the late Professor Clifford, entitled, "The Common Sense of the Exact Sciences." It is an attempt, by way of simple illustrations, to initiate non-mathematical inquirers into the mysteries of number, space, quantity, position and motion. It was, however, only a partial success as far as the class for which it is designed is concerned, though deeply interesting to such as the old Greek would have admitted to his school. Mr. Iles has, it seems to us, achieved a much greater victory over obstacles that every teacher must have encountered in endeavouring to make geometrical truths perfectly clear to ordinary pupils. His treatise to which we referred in our notice of the *Popular Science Monthly* for November, is an admirable example of "common sense in the exact sciences."

To make, for instance, an apparatus for the extraction of cube root would seem a difficult task. Yet all that is necessary is a cone and a jar half full of water, both graduated. Immersing the cone apex downward enables the operation to be performed. When cinders are shaken from a grate the smallest turn black soonest; for a similar reason the moon is a frozen globe, the larger earth is habitable, and the sun still pours out its stores of light and heat. When a phial partly filled with water is smartly shaken the larger bubbles come to the surface first; on the same principle the biggest steamer, other things equal, is always the quickest. These and other object lessons are made possible by Mr. Iles's original and entertaining paper, which should be in the hands of every instructor of youth.

#### DR. KINGSFORD'S HISTORY.

In our notice of the fourth volume of Dr. Kingsford's "History of Canada" in our last number it ought to have been stated that the work is on sale in this city at the store of Mr. Eben Picken, 33 Beaver Hall Hill, to whom orders for the last volume, or for the four volumes, may be sent.

#### THE BOOK BUYER.

The Christmas edition of *The Book Buyer* is full of attractive and interesting features. The frontispiece is a fine portrait of Sir Edwin Arnold, which is especially opportune in view of the publication of his new poem, "The Light of the World." Richard Henry Stoddard contributes a biographic sketch of Sir Edwin and a criticism (which is thoroughly independent) of his genius and work as a poet. Laurence Hutton writes of the "Curiosities of Jane Eyre." Reviews of and illustrative extracts from the more important recent works, by Noah Brooks, amply and beautifully illustrated from the works themselves, with correspondence from the leading centres of book-production, complete a very acceptable guide to would-be holiday purchasers. New York: Charles Scribner's Sons; Montreal: Eben Picken.

#### HEMLOCK.

Those who have read the first of the series of Gleaner Tales will be glad to have a second instalment. As its title informs us "Hemlock" is a tale of the war of 1812. It begins in Montreal and takes us through some of the most memorable scenes of conflict of that troubled time. An episode of the Acadian migration to Quebec forms the second and shorter portion of the volume. Mr. Robert Sellar, the author, has done justice to both his subjects. (Montreal: F. E. Grafton & Sons.)

#### CANADA FIRST.

Many of our readers will rejoice to know that this memorial of the late William A. Foster, Q.C., has been brought out by his friends. It is made more valuable by an introduction from the pen of Dr. Goldwin Smith, and a fine portrait of Mr. Foster, from the painting by Mr. Wm. Cutts, in the possession of the National Club. Besides the sketch of Mr. Foster's life and patriotic work, the volume contains his most important essays and addresses. As our readers may recall, a portrait of Mr. Foster and a brief account of his career appeared in THE DOMINION ILLUSTRATED shortly after his death. (Toronto: Hunter, Rose & Co.)

\* My Class in Geometry. By George Iles. Reprinted from the *Popular Science Monthly*. New York: D. Appleton and Company.