

of the square shield, very long spear, and sword of the present inhabitants. These men are provided (Fig. 3) with a small round shield and three javelins, thus proving that they are "Libyco-berber" productions.

A. C. H.

THE MINERAL RESOURCES OF CANADA.

THE publications of the Geological Survey of Canada have long been characterised by the want of promptness of publication. This defect is, however, to a large extent removed by the new departure made by the section of mines under the direction of Mr. E. D. Ingall. It consists in issuing a series of bulletins, giving in condensed and popular form information regarding the mineral resources of the Dominion, together with particulars of similar occurrences in other countries, which may be of use to mining engineers in Canada. We have received thirteen of these bulletins, and from the information given it is evident that the mineral resources of the Dominion are of a most varied character, and that the mineral industry is in a healthy condition. The subjects dealt with are platinum, coal, asbestos, infusorial earth, manganese, salt, zinc, mica, molybdenum and tungsten, graphite, peat, apatite, and copper.

So far the production of platinum has been obtained from placer workings on the Similkameen river in British Columbia. At Sudbury, Ontario, it is found *in situ* in combination with arsenic and associated with the nickelliferous pyrrhotite deposits. The yield of platinum in Canada has been falling off for some years past and is now insignificant.

The bulletin on coal covers sixty-four pages, and contains a collection of analyses of typical coals and a valuable bibliography of the subject. In 1902 the output of coal in Canada exceeded seven million tons. The principal areas at present worked are the Nova Scotia coalfields with rocks of Carboniferous age, and the Cretaceous coalfields of Vancouver island, and of the Crow's Nest Pass, British Columbia. Anthracite is mined in Alberta, and lignite is mined in the Souris river district, Assiniboia, and in the Yukon district.

The asbestos industry of Canada is of considerable importance, the production having increased from 380 tons in 1880 to 40,000 tons in 1902. Canada now furnishes about 88 per cent. of the world's supply. The deposits are found in serpentine. In 1896 the manufacture of asbestic was begun. This is a finely-ground serpentine in which there is a small amount of very fine fibre disseminated, and the resulting product is specially adapted for fine plaster for walls and interior decoration. Its value per ton is low, but as its preparation involves little extra expense, it is claimed that a profit results from its manufacture.

Infusorial earth was produced in Canada in 1902 to the amount of 1000 tons, valued at 3300*l.* It is mined at Bass river lake, and St. Ann's, Nova Scotia, and is sold chiefly in the United States. The uses to which it is put are varied. Formerly it was largely used in the manufacture of dynamite, but it has now been replaced by cheaper absorbents, such as wood pulp. It is now chiefly used as a polishing material and as a boiler covering. It can also be used in the manufacture of bricks when great lightness is required.

Although Canada has not yet taken a prominent place among the manganese-producing countries of the world, this is not due to lack of deposits of the ore. The extent of the production depends on the development of steel manufacture, and, as Canada is now making great strides in this direction, its deposits will probably soon assume greater importance. The ores represented comprise pyrolusite, manganite, psilomelane, and wad, and as some of the Canadian deposits contain a large proportion of the first-named mineral, the ore is specially adapted for chemical manufacture.

At present Ontario is the only province producing salt, the output in 1902 having been 64,000 tons. The country's chief resources consist of the rock salt beds underlying some 2500 square miles on the eastern shores of Lake Huron. The amount of salt imported into Canada is at present double the amount produced in the country, owing to the fact that salt is produced more cheaply in England, whence the bulk of the imports come.

In eastern Canada mica occurs in large and important deposits, the mining industry being chiefly confined to the provinces of Ontario and Quebec. The merchantable mica

is always associated with intrusive masses and dykes of pegmatite-granite and pyroxene, which cut the gneiss and crystalline limestone. The mica produced is chiefly used for electrical purposes.

Apatite is widely distributed in Canada in deposits in the crystalline rocks, and in fossiliferous strata of Cambrian age. In 1889 the province of Ontario produced as much as 3547 tons, but since then, owing to the competition of the cheaply mined phosphates of Carolina, the output has rapidly decreased. Graphite is widely distributed in the gneiss and crystalline limestones of Canada, the output in 1901 having been 2210 tons. Zinc ore is produced at one mine in Olden township, Ontario. The ores of molybdenum and tungsten are of frequent occurrence in Canada. Copper ores have been known in eastern Canada for nearly a century, and large amounts of capital have been expended in developing what appeared to be promising localities, but little economic success has as yet resulted.

The Canadian peat resources are dealt with by Dr. R. Chalmers in a bulletin of forty pages. The peat bogs in the eastern provinces are attracting attention in view of the depletion of the forests and the increasing prices of coal, and attempts are being made, in many cases with poor success, to utilise them in the production of fuel, coke, and moss-litter.

In connection with this valuable series of bulletins of the Geological Survey, reference may be made to a memoir in the *Ottawa Naturalist* on the marl deposits in Ontario, Quebec, New Brunswick, and Nova Scotia, by Dr. R. W. Ellis, the author of most of the bulletins mentioned. The chief value attributed to this shell-marl was supposed to be confined to its use as a fertiliser for soils deficient in calcareous matter. Recently it has been found to be specially adapted for the manufacture of the best grades of Portland cement, when mixed with a proper proportion of clay; and large manufacturing establishments have been established at several points, more especially in the province of Ontario.

The latest publication of the Geological Survey of Canada is an exhaustive report by Dr. A. E. Barlow on the origin, geological relations, and composition of the immense nickel and copper ore deposits of Sudbury, Ontario. Details of the mining, smelting, and refining methods are given, and reference is made to the character and extent of all the more important nickel ore deposits in other countries. With a production of 6253 tons of metallic nickel in 1903, valued at 5,002,204 dollars, Sudbury is the largest producer of nickel in the world; and this monograph of 236 pages, with numerous plates and maps, summarises all the previous original investigations and supplies the most detailed and accurate information regarding these important deposits yet available.

THE ROYAL HORTICULTURAL SOCIETY.¹

THE history of the Royal Horticultural Society has been chequered to an extent probably exceeding that of any other society. At one time fashionable, it enjoyed a fictitious prosperity. We say fictitious, for horticulture, especially scientific horticulture, was neglected, and, as a consequence, the wave or waves—for there were several—of prosperity broke on the shores of adversity, with the result that the gardens were curtailed, the expenditure was reduced in all directions, the valuable collections were sold or destroyed, the herbarium and the library were dispersed.

It is, however, not our purpose now to dwell on ancient history, but rather to point out the satisfactory progress in recent years of which the journal before us affords evidence. Some foreshadowings of that progress date back to the year 1866, when an international horticultural exhibition on a very large scale was held on the ground where the Natural History Museum now stands. The exhibition itself differed from others mainly in its extent and in the larger participation of foreign exhibitors. It was organised and managed, not by the society, the financial position of which at that time precluded it from embarking on such an enterprise, but by a special committee presided over by the late Sir Wentworth Dilke, to whose organising faculty and strenuous labour the success obtained was largely due.

¹ The *Journal* of the Royal Horticultural Society, vol. xxix., parts i., ii., and iii.

If this exhibition had been merely a flower-show on a gigantic scale there would have been little or no need to advert to it in these columns. But associated with it was a botanical congress attended by many of the chief European notabilities, and presided over by the late Alphonse de Candolle. The results of their discussions were recorded in a report of proceedings which still forms a most valuable document. Copies are now rarely met with, although they were distributed widely among foreign and British botanical libraries.

We have a special reason for alluding to this nearly forgotten congress, because it may be looked on as the progenitor of two important events in the modern history of the Royal Horticultural Society. A large surplus was eventually derived from the exhibition, and this surplus was devoted to the publication of the proceedings before mentioned, to charitable purposes, and to the purchase of the valuable library of the late Dr. Lindley. This library was placed in the hands of trustees for the benefit, primarily, of the fellows of the Royal Horticultural Society, and, under certain regulations, of the general public also. In this way the society once more became possessed of an extensive library, which cannot be alienated if evil days should again arise. It is now, after various vicissitudes, fittingly installed, at the expense of Baron Sir Henry Schröder, in the new building erected for the society in Vincent Square, Westminster.

Thus has been accomplished one result of the congress of 1866. Another consequence of that meeting was the formation of a scientific committee under the presidency of Sir Joseph Hooker, which has endeavoured so far as circumstances permitted to carry out the objects formulated in M. de Candolle's presidential address. The early days of the committee, when such men as Sir Joseph Hooker, Mr. Berkeley, Prof. Westwood, Mr. Wilson Saunders, Colonel Clarke, Mr. Andrew Murray, Sir William, then Mr., Thimelton-Dyer, and other naturalists took part in the discussions, remain as a pleasant memory. The Rev. Prof. Henslow, who acted as secretary for the last quarter of a century, has only lately relinquished his office. The committee still includes a body of experts in many departments of horticulture and natural history generally.

We have alluded to the new building, to the erection of which Baron Schröder has magnificently contributed, whilst others have not been backward. Much, however, remains to be done, and until the existing debt is cancelled not much in the way of scientific experiment or research can be effected. The society has been exceptionally fortunate in its centenary year. Not only has it secured a fine hall for exhibition purposes, together with commodious offices and accommodation for the library, but through the generosity of Sir Thomas Hanbury it has come into possession of the late Mr. G. F. Wilson's interesting garden at Wisley, near Weybridge.

The old garden at Chiswick, the value of the services of which in the past is beyond compute, has been abandoned, soil and climate no longer being propitious for gardening operations. The cultural trials hitherto carried out at Chiswick will henceforth be conducted at Wisley, and there is every reason to hope that in a short time a research station under a competent director may be established, and thus a great and pressing need may be supplied.

This is rather a long preface to the notice of the *Journal*, but we hope it will not be thought irrelevant. The necessity for a journal to link together all the otherwise separate departments of the society has always been recognised, but in the evil days aforementioned the publication was often spasmodic and irregular. Since the appointment of the Rev. W. Wilks as secretary, and under the steady impulse of the president, Sir Trevor Lawrence, a great improvement all round has been manifested, and in no way more remarkably than in the contents and regularity of issue of the journal. So marked is the improvement that it has become too much for the digestion of some people, and some of the fellows are crying out, not for more, but for a more limited supply.

Our notice has extended to such a length that we can only indicate some of the contents other than those relating merely to practical cultivation; such are Dr. Cooke's article on the fungous pests of the shrubbery, with coloured illustrations; on the heredity of acquired characters, by Prof.

Henslow; gooseberry mildew, by Mr. Salmon; diseases of Calanthes, by Mr. Bidgood; note on electric heating, by Mr. Rogers; diseases of the potato, by Mr. Masee; Indian primulas, by Sir George Watt; and a large number of other communications which tend to show that the scientific side of horticulture is not neglected. The abstracts from botanical and horticultural literature which have of late formed so important a feature of the *Journal* are omitted from the present part, possibly because so much space has, not unnaturally, been devoted to the proceedings in connection with the centenary celebration and the formal opening of the new hall by H.M. the King.

The interests of the commercial side of horticulture, however great their importance, can very well be left to take care of themselves. Nevertheless, the cultivators may well look to the society for light and guidance in such matters as cucumber spot, and the many diseases which so very seriously affect their business prosperity. Progressive horticulture looks to the society to investigate outstanding problems, open out new paths, and generally to acquire and diffuse useful knowledge. Even if not immediately useful, such knowledge is sure eventually to be of advantage even to the "practical man." With a research station at Wisley, a competent director, a sympathetic scientific committee to direct and advise, and an energetic secretary, the society may on entering its second centenary look forward to being able to advance scientific horticulture in a more thorough manner than it has ever done before.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE *Pioneer Mail* states that a gentleman of Nagpur has bequeathed a sum of fifty thousand rupees to the Central Hindu College, Benares.

At the spring graduation ceremony of the University of Edinburgh on April 7 the honorary degree of LL.D. was conferred upon Prof. W. W. Cheyne, C.B., F.R.S., Dr. J. H. Jackson, F.R.S., Dr. A. D. Waller, F.R.S., Sir Frank E. Youngusband, and Prof. G. A. Gibson.

THE Catholic University of America will receive, says *Science*, a bequest of 20,000*l.* from Miss Helen Tyler Gardiner. We learn from the same source that Mr. Andrew Carnegie has agreed to give a 10,000*l.* library to the Washington and Lee University on condition that the university raises an endowment of 10,000*l.* for maintaining it.

THE *Glasgow Herald* announces that by the will of the late Mr. Donald the sum of 20,000*l.* is bequeathed to the Glasgow and West of Scotland Technical College, to be paid on the death of Mrs. Donald. After various other bequests have been made, the residue of the estate is to go to the governors of the Glasgow and West of Scotland Technical College for purposes specified in the trust disposition and settlement.

THE committee of the Privy Council has decided to recommend the King to grant a Charter incorporating a university in Sheffield. A large sum of money has already been given or promised for the endowment of the university, and, in addition, the city council has pledged the city to the gift annually of a sum equal to the proceeds of a rate of 1*d.* in the pound (the capitalised value of which gift is 200,000*l.*). The draft Charter of the proposed university provides for the establishment of a teaching university with powers to grant degrees in the faculties of arts, science, technology, and medicine.

THE articles of agreement under which it is proposed to combine the Massachusetts Institute of Technology and Harvard University have been made public. Provision is made for a joint school of industrial science, to be known under the present name of the Institute of Technology, to be governed by an executive board of nine members, of which three shall represent Harvard, and to be maintained by present institute funds, augmented by the income of all funds of the Lawrence Scientific School, by three-fifths of the net income which may accrue from the Gordon McKay bequest, amounting to several millions, and by the income of all property which Harvard may hereafter acquire for the promotion of instruction in industrial science.