déracineuse Lobo." This operation costs 4*d.* per tree uprooted; but the poles are thus a foot longer than those that are simply felled, and the roots are used for fuel, while the land can be at once planted, without waiting three years from fear of the pine-weevil (*Hylobius abietis*), which otherwise breeds in the stumps, and then destroys the young crop planted to replace the felled trees.

The last forest visited by the society was the Forêt de Soignes, one of the most magnificent beech forests in Europe. The oldest crops consist of columnar beeches 130 years old, 130 to 140 feet high, averaging 4½ feet in girth at chest height, and containing per acre 7000 cubic feet (quarter-girth measure). This forest of 10,210 acres yields a net annual revenue of 18,000*l.* for timber alone; the game, chiefly roebuck, rabbits, and pheasants, is fully worth 4*s.* an acre, but is retained for the King.

The geographical arboretum at Tervueren merits special attention. Here, 75 acres of good undulating loamy land, with a crop of small oak and other saplings, which serve as a shelter-wood, are being planted with exotic trees. The whole area is subdivided into the Old and New Worlds, and each of these into smaller sections, representing countries running from north to south. Thus the "New World" is first subdivided into the Pacific and Atlantic regions, and the former into Alaska, Rocky Mountains, Pacific coast region, and Chile. The Atlantic region into Canada and the Alleghany Mountains. The Old World comprises Northern, Central, and Eastern Europe, Siberia, Caucasus, the Himalayas, Japan, and N. China.

In each of these regions the characteristic trees, broad-leaved and conifers, are planted in their natural mixture. It is also intended to plant among them the shrubs and herbaceous plants that naturally grow with the trees, and this has already been done for Japan. Mr. Bommer, the curator of the Botanic Museum at Brussels, is in charge of this arboretum. He has an extensive forest nursery where he rears the necessary plants. This bold and scientific design is due to the initiative of the King of the Belgians, who has presented the State with the splendid domain of Tervueren, the management of which he still controls.

The Director-General of Forests, Mr. Dubois, has certainly organised the administration of the Belgian forests in a remarkably progressive way, and the system he has adopted in Belgium is probably more suited than those of France and Germany for the future development of forestry in Britain.

W. R. FISHER.

THE CAPE GEOLOGICAL SURVEY.¹

THE presentation of the ninth annual report of the Geological Commission of the Cape of Good Hope will be welcomed by all interested in the prosperity of one of our oldest colonies in Africa. We have been so long accustomed to see similar surveys started and then abandoned before sufficient information had been obtained to yield permanent results that we were afraid that the publication of this report might possibly have been postponed. The past record of surveys of Cape Colony has, indeed, been a dismal one, so hampered have they been in their prosecution, so undervalued have been the results. Fortunately, necessity knows no law, and there are few portions of Africa which do not possess a more or less fully equipped geological survey.

A considerable amount of new and useful knowledge was obtained in Cape Colony during 1904, though the results are not so complete as they doubtless would have been if lack of funds had not prevented the continuation of the survey in important areas, but where the cost of hired transport was found to exceed the limit of the grant voted for the survey.

In the introduction by the director the main results obtained during the past year are recorded, but all too briefly. How little is known of the different rock groups even in these southern and best known regions of Cape

Colony is shown by the discovery of a new set of rocks, termed Nieuwervst series, which are found to be newer than the Ibiquas and Malmesbury series, but older than the Table Mountain Sandstone. The succession in southern Cape Colony, the type region for South Africa, is thus being brought into closer approximation with that of northern Cape Colony and the Transvaal, with a result that cannot fail to be beneficial to both. Further, a closer parallelism is found to exist between the geological history of South Africa and the southern continents than zoologists and geologists dared to hope, but on which each alike confidently felt would be the case.

In the detailed account Mr. Rogers describes the geology of the north-western part of Van Rhyns Dorp. Among the Malmesbury beds a characteristic feature consists of the abundance of crystalline limestones intercalated between slates and phyllites. The account of the intrusive granites and the metamorphic rocks with the associated sillimanite-cordierite schists contains much of interest. The Ibiquas series and the unconformably overlying Nieuwervst series deserve close attention, owing to the light they will probably throw on the Transvaal succession.

In the district of Long Kloof Mr. Schwarz finds the geology to be highly complicated by folding. A somewhat fanciful explanation is offered to account for the elevation of the mountains in this area being no greater than in the less folded regions composed of the same rocks.

In the description of the geology of Aliwal North, Herschel, Barkly East, and part of Wodehouse, Mr. du Toit enters into much detail concerning the stratigraphy and composition of the Upper Karroo beds and the volcanic phenomena associated with them. A great addition to our knowledge of the sedimentary and volcanic beds of the Stormberg series will here be found. By means of the special reptilian contents in the upper portion of sandstones, red and purple shales, mudstones and clays, it has been found possible to subdivide the great thickness of the Beaufort series. For this superior group the term Burgersdorp beds is proposed. Besides their abundant reptilian contents, they are further interesting from the occurrence of *Lepidodendron* in association with *Glossopteris* and *Thinnfeldia*.

In the succeeding Stormberg period chief interest is centred in the careful description of the volcanic outbursts, more especially of that of the volcanic necks. Of these, thirteen are recorded from Wodehouse, twenty from Barkly East, and twenty-two from Herschel, those in Aliwal North being left for further investigation. The description includes most reasonable hypotheses for the formation of the different types of rock infilling the necks. The immense flows of lava and numerous dolerite intrusions receive due attention, the intrusion of the dolerites being placed somewhere between the Middle Jurassic and Lower Cretaceous.

Questions of economic importance will be found to have been thoughtfully considered. It is disappointing to find that so far the coal seams met with in Aliwal North and Herschel are thin and of less value than in the south.

The introduction throughout the report of black and white geological maps of the areas surveyed with a sufficient number of place-names enables the reader to follow the various descriptions with ease. The absence of headlines, and the want of a copious table of contents, constitutes a drawback to the general reader, particularly where the report deals with petrological descriptions.

Those persons who consider that the work of a national survey should be primarily devoted to the economic aspect of the inquiry will doubtless be disappointed at the apparent poverty of the commercial results obtained by the Survey since the date of its commencement in 1806. The explanation is obvious. A national survey cannot be formed for a particular section of the community interested in the discovery of gold, coal, or diamond fields. It is, however, expected of such a survey, and that of the Cape fully realises the expectation, that the maps and memoirs it publishes should represent the most trustworthy and technical information it is possible to obtain as to the geological structure of the country it professes to examine, and on which the practical man who follows must and does base his conclusions.

W. GIBSON.

¹ Ninth Annual Report of the Geological Commission of the Cape of Good Hope. Pp. 181. 1904. (Cape Town, 1905.)