

preparations containing soap, such as the French 'savon pyrèthre', are liable to gradual deterioration; petroleum extracts with a non-alkaline emulsifier are, however, stable for considerable periods. A formula for the preparation of a spray fluid of the latter type has been published by Tutin,⁷ and proprietary products of a similar kind were placed on the English market last year.

Walton⁸ has obtained very promising results with sprays of this type for the control of the raspberry beetle, a serious pest of raspberries and loganberries; and preliminary experiments with these fluids against red spider and against the apple capsid bug, both important pests of fruit and difficult to control, have also been successful. Although different kinds of insects vary somewhat in the degree of resistance that they offer to the effects of pyrethrum, a great

many important pests are killed by preparations containing 0.0025 to 0.005 per cent of pyrethrins, that is, approximately the equivalent of 0.5 to 1.0 per cent of flowers. The pyrethrins appear to act upon insects as nerve poisons, and they are undoubtedly among the most powerful insecticides known; the range of their usefulness has by no means yet been fully explored.

¹ J. C. F. Fryer and R. Stenton, *Min. Agric.*, **33**, 916; 1927.

² J. C. F. Fryer, F. Tattersfield, and C. T. Gimingham, *Ann. App. Biol.*, **15**, 423; 1928.

³ *Helv. Chim. Act.*, **7**, 177; 1924.

⁴ *Ann. Acad. Sci. Fennicæ*, A, **29**, No. 18; 1927.

⁵ (a) F. Tattersfield, R. P. Hobson, and C. T. Gimingham, *J. Agric. Sci.*, **19**, 266; 1929.

(b) F. Tattersfield and R. P. Hobson, *J. Agric. Sci.*, **19**, 434; 1929.

(c) J. T. Martin and F. Tattersfield, *J. Agric. Sci.*, **21**, 115; 1931.

⁶ *J. Amer. Chem. Soc.*, **51**, 3054; 1929; **52**, 680; 1930.

⁷ F. Tutin, *Long Ashton Res. Stat. Rept.*, p. 96; 1928; p. 93; 1929.

⁸ C. L. Walton, *J. Pom. and Hort. Sci.*, **8**, 173, 309; 1930.

Geology in Great Britain.

THE "Summary of Progress" of the Geological Survey of Great Britain for 1929 is issued in three parts, of which the first is devoted to an account of the routine work during the year under review, while the others contain papers on subjects of special interest. Part 1¹ embodies the annual reports of the Geological Survey Board and of the Director. Sixty-six maps were published during 1929, with eight memoirs, which, with the exception of that dealing with Moreton in Marsh (see below), have already been noticed in our columns (*NATURE*, Aug. 16, 1930, p. 258). The memoirs in the press at the close of the year have since appeared and are reviewed below.

The most important event in the progress of the Survey during 1929 was the beginning of operations for the building of a new museum, library, and offices on a site in Exhibition Road, South Kensington, midway between the Natural History Museum and the Science Museum. The Geological Museum will have direct connexion with each of these by means of passages open to the public. The work now in progress will take at least three years to complete. New offices have been occupied in Edinburgh and a scheme for the erection of an additional building is under consideration. Field work has for some years been concentrated on the revision of the coalfields. In Yorkshire, Lancashire, and Northumberland this is still actively in progress; elsewhere the surveys are approaching completion, though the maps and memoirs have still to be published. Reports on six districts in England and four in Scotland, and on the palaeontological, petrological, and chemical work in progress, contain many records of current interest.

In Part 2² the results of a magnetic survey of part of north Leicestershire are recorded and discussed by A. F. Hallimond. A valuable petrological study of the hornfelses from Kenidjack, Cornwall, is provided by C. E. Tilley and Sir John Flett. It is thought that the original dolerite intrusions of the area were intensely weathered and leached, and afterwards sheared and thermally metamorphosed with the production of cordierite-anthophyllite rocks and cummingtonite rocks. In view of the occurrence of similar rocks elsewhere in puzzling circumstances, this paper is of much more than local importance. H. G. Dines and F. H. Edmunds show conclusively that it is unsafe to base stratigraphical deductions on mechanical analyses of the formations of the Lower Greensand. Four other papers record noteworthy stratigraphical and palaeontological observations.

Part 3³ contains an account of magnetic work on the Swynnerton Dyke, also by A. F. Hallimond. Sir John Flett describes a teschenite, 224 feet thick, encountered in a boring at Easter Dalmeny, west of

Edinburgh, and devotes special attention to the variation of mineral composition and specific gravity with depth. The discussion of differentiation is particularly illuminating and should be seen by all petrologists. Bernard Smith contributes a useful study of the origin of the St. Bees-Whitehaven Gap. Important palaeontological investigations are recorded in R. Crookall's account of *Palaeocypris* and related genera, and in W. S. Bisat's paper on the goniatite and nautiloid fauna of the Middle Coal Measures of England and Wales. The accurate determination of hitherto confused species makes possible a notable advance in the correlation of the English and German Coal Measures. Other papers deal with the Pliocene of Hertfordshire and a boring in the Lower Oil-shale Group of Burntisland.

Few memoirs in recent years have approached that dealing with north Ayrshire,⁴ in the wide variety, general interest, and scientific importance of the topics discussed. The area is characteristic of much of the Central Valley of Scotland, and includes a long succession of sediments from the Downtonian to the New Red Sandstone, and a remarkable number of igneous episodes of different ages. Lava suites occur in the Lower Old Red Sandstone, Calciferous Sandstone, Millstone Grit, and New Red Sandstone (? Permian). In addition, beds of volcanic ash occur at intervals in the Limestone Coal and Upper Limestone Groups, and there are many north-west dykes that can confidently be referred to the Tertiary. A remarkable range of petrographic types is represented, and petrologists abroad, as well as at home, will find the memoir a rich storehouse of highly significant records, analyses, and associations. A summary of the geology and an account of previous researches are given in the first two chapters. The chief rock groups, sedimentary and igneous, are ably dealt with in successive chapters. Special attention is directed to the fauna of the Carboniferous and the flora of the Coal Measures. A detailed account of the glaciation of the district follows and includes a description of fossiliferous beds of Pleistocene age found beneath the boulder clay of certain areas. A special feature of the memoir is the chapter on the soils and agriculture of north Ayrshire. It should be noted that in addition to the beautiful one-inch maps (Solid and Drift editions) published in 1928, a soil-texture map on the same scale is also available. The latter was issued in 1929 and was prepared under the supervision of the late Prof. R. A. Berry.

The new memoir on the Alnwick district⁵ deals with the country stretching from the Cheviot foothills to the coast between Warkworth and Embleton, and includes some of the chief beauty-spots of North-

umberland. The rocks are mostly of Lower Carboniferous age and the diversity of sediments affords many interesting problems. Of special interest is the famous Shilbottle coal, the most valuable Lower Carboniferous seam in the north of England. Chapters are devoted to the Whin Sill, glacial, and post-glacial deposits, and economic geology. Details of borings and sinkings made in recent years are given in an appendix, and there is a useful glossary of the local and mining terms of north Northumberland.

The Maryport memoir⁶ covers part of the West Cumberland coalfield and is the first systematic account of a difficult and intricate region. Most attention is given to the Productive Coal Measures, their correlation with the seams in other parts of the field, the complicated faulting of the strata, and the structural features of the adjoining concealed coalfield. The whole district has been heavily glaciated; exposures are few; and detailed mapping has been largely dependent on mining information. The remaining chapters deal with the Skiddaw Slates, the Carboniferous Limestone, the Whitehaven Sandstone series, the New Red Sandstone, glacial and recent deposits, and the economic geology of the district.

The memoir⁷ describing Sheet 77 deals with a region of great industrial importance, extending from Blackstone Edge Moors to Dewsbury, and embracing Huddersfield, Halifax, Batley, Brighouse, the southern part of Bradford, and some of the suburbs of Leeds. The region lies on the easterly dip-slopes of the Pennines, and, apart from the superficial deposits, the rocks all belong to the Millstone Grits and the Lower and Middle Coal Measures. The geology of these formations is fully discussed, and there are chapters on structure, glacial deposits, local fossils, and economic geology, special attention being devoted to the goniatite zones and to the occurrence of marine bands in the coal measures. Records of borings, a list of quarries, and a list of geological photographs (of which prints and lantern slides can be supplied) are given as appendices.

The district represented on Sheet 217 is an attractive residential and agricultural area in the Cotteswolds ranging from Cheltenham to Chipping Campden.⁸ Roughly, about half the region is in the Severn basin and about half in the Thames basin. Apart from the superficial formations, which are here of great variety and interest, and the concealed Palaeozoic floor, the rocks belong to the Lower and Middle Jurassic. Since the days of Murchison (who described the geology in 1834) the area has provided an attractive field for many active workers, including the late S. S. Buckman and the author of the memoir. Mr. Richardson has demonstrated, for the first time, the relationships of the Estuarine deposits of southern Northamptonshire and northern Oxfordshire to the marine Inferior Oolite of the Cotteswolds. The memoir is an admirable guide to the geology of a classical and much-visited region.

The next two memoirs belong to the county series in which the sources of underground water are recorded. The Worcestershire volume⁹ provides an excellent short account of the geology and structure of the county, and is illustrated with a clear map and several sections. The chief regional water undertakings are covered, and the supplies of the rural and urban areas are described in detail. Special attention is given to the waters of Malvern and Droitwich, and a comprehensive series of water analyses is provided by the county analyst, Mr. C. C. Duncan. The Gloucestershire memoir¹⁰ is of unusual interest because of the great variety of rocks that occur in this variegated and delightful county. As usual in this series, an admirable general introduction to the

geology is provided, with maps and sections. Detailed accounts of the water supplies of Bristol, Gloucester, and Cheltenham are given. The saline waters of Cheltenham originate in the Lower Lias, while the chalybeate springs issue from a superficial gravel in which there is an admixture of peaty matter. Other rural and urban district supplies are described with a wealth of detail, and numerous analyses and full bibliographies are added. Twenty-four memoirs on the underground water supplies of counties have been published to date.

¹ Summary of Progress of the Geological Survey of Great Britain and the Museum of Practical Geology for the Year 1929. Part 1. Pp. iv+100. 2s. net.

² *Ibid.* Part 2. Pp. iv+80+3 plates. 2s. net.

³ *Ibid.* Part 3. Pp. iv+89+8 plates. 2s. 6d. net.

⁴ Geology of North Ayrshire (Explanation of One-inch Sheet 22, Scotland). By J. E. Richey, E. M. Anderson, and A. G. MacGregor, with contributions from E. B. Bailey, G. V. Wilson, G. A. Burnett, and V. A. Byles; Palaeontological Chapters by the late G. W. Lee and R. Crookall; and an account of the Soils and Agriculture by the late Prof. R. A. Berry, E. M. Melville, and C. Loudon, of the West of Scotland Agricultural College. Pp. viii+398+10 plates. 10s. net.

⁵ The Geology of the Alwrick District (Explanation of Sheet 6). By E. G. Carruthers, G. A. Burnett, and W. Anderson, with contributions by C. H. Dinham and the late J. Maden. Pp. vii+138+4 plates. 3s. net.

⁶ The Geology of the Maryport District (Explanation of Sheet 22). By T. Eastwood. Pp. viii+137+3 plates. 3s. net.

⁷ The Geology of the Country around Huddersfield and Halifax (Explanation of Sheet 77). By D. A. Wray, J. V. Stephens, W. N. Edwards, and C. E. N. Bromehead. Pp. vi+221+5 plates. 4s. 6d. net.

⁸ The Country around Moreton in Marsh (Explanation of Sheet 217). By L. Richardson, with contributions by A. E. Trueman, D. M. Williams, R. C. Gaut, and H. G. Dines. Pp. vi+162+6 plates. 4s. 6d. net.

⁹ Wells and Springs of Worcestershire. By L. Richardson, with contributions by Cecil Cooke Duncan and E. Brotherton. Pp. vi+219+1 plate. 4s. net.

¹⁰ Wells and Springs of Gloucestershire. By L. Richardson. Pp. vi+292+1 plate. 5s. net.

(London: H.M. Stationery Office.)

University and Educational Intelligence.

ABERDEEN.—The honorary degree of LL.D. was conferred upon the following, among others, at the graduation held on April 1: Sir Leonard Hill, Sir Frank Smith, Prof. C. R. Marshall, and Sir J. Arthur Thomson.

CAMBRIDGE.—The Appointments Committee of the Faculty of Economics and Politics will shortly proceed to appoint a University lecturer in statistics, the duties to begin on Oct. 1. Candidates are requested to communicate with the Registry of the University not later than May 1.

The General Board has made the following grants from the Worts Fund: £100 to the Zoological Station at Naples; £45 to Miss W. Lamb, of Newnham College, for the continuation of her excavations at Thermi; £45 to Dr. E. B. Worthington, of Gonville and Caius College, towards the expenses of the Cambridge Expedition to the East African Lakes; £45 to Dr. L. S. B. Leakey, of St. John's College, for archaeological, palaeontological, and geological investigations in East Africa; £45 to G. Bateson, of St. John's College, for anthropological work in New Guinea; £30 to R. T. Wade, of Clare College, towards his expenses in connexion with visits to museums in Europe to study fossil fish; £20 to P. W. Richards, of Trinity College, towards the expenses of a botanical expedition to the Sierra Nevada; £15 to I. H. Cox, of Magdalene College, for geological exploration in Baffin Land.

It is proposed to confer the degree of Sc.D. *honoris causa* upon Prof. J. S. Haldane, honorary professor and director of the Mining Research Laboratory in the University of Birmingham.

EDINBURGH.—At the meeting of the University Court on Mar. 23, a letter was read from Sir Alexander