

## COAL PETROGRAPHY

THE International Committee for Coal Petrology has recently prepared a second edition of its *Handbook of Coal Petrography* which has now been published by the Centre National de la Recherche Scientifique, 15 Quai Anatole-France, Paris 7<sup>e</sup>. English, German or French texts are available from this organization and the Russian text from the Academy of Sciences of the U.S.S.R.; each volume costs 54 N.F. Since normal retail channels will not be used for distribution of this work, a member from each nation represented on the Nomenclature Sub-committee of the International Committee has been asked to contribute a short note about the *Handbook* to an appropriate journal in his or her country. In this way it is hoped that coal scientists and petrographers working in related fields will be made aware of the existence of the *Handbook* and can obtain a copy, if they wish, from one of the aforementioned sources.

The first edition of the *Handbook* was published in 1957 in glossary form. The second edition has been considerably expanded and revised. It is divided into two parts, the first and lengthier dealing with nomenclature, the second describing methods of petrographic analysis.

The original publication of 1957 was concerned mainly with the Stopes-Heerlen system of petrographic nomenclature of coals and their constituents that is used primarily in Europe. Further terms have been added to this system in the intervening six years, and the new definitions are now included in the *Handbook* together with a considerable number of terms from the Thiessen-Bureau of Mines system of nomenclature. This is the other principal system of petrographic classification and it is used mainly in the United States. A brief outline is also given of the important nomenclature recently introduced in the United States by Prof. Spackman. A summary of the genetic classification of the Geological Institute of the Academy of Sciences of the U.S.S.R. is also included as well as definitions of eleven of the more important terms from this system. Definitions of a number of general terms used in coal petrology have also been added to the *Handbook*.

Only the petrographic nomenclature of the 'hard coals' (bituminous coals and anthracites) is considered in the *Handbook*. The petrography of the soft brown coals is still under discussion by the Nomenclature Sub-committee and no terms or definitions have yet been published. The *Handbook* is in the form of a strong loose-leaf folder made up of sheets approximately  $9\frac{1}{2} \times 6\frac{1}{4}$  in. in size. In the nomenclature section, 47 of the 149 sheets are plates composed of 108 photomicrographs; 4 sheets contain line diagrams. Eighty-one terms have been defined in this section, the text giving details of origin, description and, in the case of macerals, microlithotypes and lithotypes, their occurrence and practical importance. Where possible, correlation of terms with those in other systems of nomenclature have been made. Photomicrographs that illustrate various features have been taken where necessary by transmitted and reflected light; many are in colour.

Methods of analysis have been included in the *Handbook* because they have helped substantially towards better definitions of the petrographic constituents of coals. The Analysis Sub-committee was formed in 1955, and the second short section of the *Handbook* presents the findings of the Sub-committee since then. Exchange of approximately 100 samples between petrographic laboratories in different countries has led to considerable improvement in maceral and microlithotype analyses, as well as to the formulation of recommendations for the preparation of samples and their examination in reflected light. Sixteen sheets, two being plates and one a line diagram, are devoted to general notes on methods of quantitative analysis of polished coal surfaces, maceral and microlithotype analyses on particulate blocks and suggested procedures for the preparation of samples.

Although the nomenclature of the 'hard coals' is now well established, the definitions presented in the *Handbook* are not necessarily final. Amendments may be made in the future and further terms added to the different systems of nomenclature. All terms and definitions do, however, accord so far as possible with the present state of knowledge in coal petrology.

D. G. MURCHISON

## EXPLORATION OF THE SEA

THE total water-surface of the Earth is estimated at 70.8 per cent of its area, and of this the overwhelming proportion is represented by the oceans. Geological science has done much to elucidate the nature, composition and structure of the Earth's surface; aerial reconnaissance and especially modern geophysical techniques have, during the past four decades or so, materially increased our knowledge, but it still remains relatively superficial. The nature of the Earth's interior, be it liquid core or otherwise, is largely a matter of hypothesis, although the Operation Mohole project launched in 1961, to drill a hole 7 miles deep into the mantle-rock from a ship stationed north of Puerto Rico, may, if successful with samples from depth, throw further light on the problem. By contrast, exploration of space, the atmosphere and beyond, is being pursued on a vast and ever-increasingly costly scale by means of instruments borne by rockets and Earth satellites; in the near future we may find out what is the geology of the Moon.

In a recent lecture, Sir Frederick Brundett, referring to the comparative neglect by science of the sea, is

reported to have said that "The world . . . must be *mad* to spend more in a year on space research than has been spent on studying the oceans in the last hundred years". In a paper read before the Royal Society of Arts (*Journal*, 111, No. 5086; September 1963) Dr. T. F. Gaskell, scientific adviser in the Information Department, British Petroleum Co., Ltd., formerly with the Royal Naval Scientific Service engaged in research in anti-submarine mine counter-measures and beach reconnaissance, pursues this theme, explaining why advances in our knowledge of the sea have been slow, what is the trend of contemporary oceanic investigations and what lies in store economically and scientifically as we learn more of the sea in future.

Dr. Gaskell makes some pertinent points at the outset. The sea is a difficult place in which to work. "Sea-water is . . . opaque and this is the first difficulty that faces the oceanographer. Most of the tools needed to investigate the sea must use physical principles which are more complicated than the optical methods that are so satisfactory for studying the surface features of the land."

"... sea-water contains enough salt to be neither a really good conductor of electricity nor a useful insulator, so that in this respect also it is more difficult to work in than is the atmosphere. The salt water also militates against the scientist by being corrosive, and to ensure that experiments shall be conducted with the maximum of difficulty and discomfort, the sea surface is seldom still." Again, "The greater part of the oceans is about three miles deep, so that when apparatus must be lowered to the sea-bed long cables are needed".

Undoubtedly the navies of the world, especially those of the great maritime powers, during and since the Second World War, have contributed much to our knowledge of the sea itself, also of the shape of the deep sea-floor; this is an important factor for submarines, now accustomed to diving much deeper and staying submerged far longer than formerly. Detection of submarines demands an understanding of sound-wave propagation in

the sea-water medium, which in turn requires more accurate measurements of temperature and density distribution in the oceans. Of the more peaceful aspects of future ocean investigations are off-shore drilling for new oilfields or important extensions of known continental developments; these projects are proceeding apace to-day and, apart from oil-finding, every hole drilled provides more information of sedimentary accumulations, past and present, forming the continental shelves concerned. In the long run, however, it is the fish in the sea that will take pride of place in future oceanic researches. Increase in world population will compel more attention to the sea as a vast food-producer. As Dr. Gaskell observes: "... we hunt the fish that Nature provides, just as our ancestors hunted animals for food. We have not yet begun to herd fish or to improve their quality—but one day we shall be forced to farm the seas as we do the land".

H. B. MILNER

## THE ROWETT RESEARCH INSTITUTE

THE report of the Rowett Research Institute for the year 1962-63\* is on the same lines as that for the previous year; that is to say, the main section of the report summarizes the numerous papers which have appeared during the year and supplements these summaries with additional unpublished information so as to bring the accounts of the research more nearly up to date. In all, some 150 original papers published by workers in the Institute are referred to, together with references to about 40 papers in preparation and other unpublished observations. These considerable numbers give some idea of the great mass of work proceeding in the Institute, and of the magnitude of the task of presenting a succinct and intelligible account of it within reasonable compass. In addition to this general account of present research within the Institute, the report contains two special contributions on topics deemed to have reached a stage suitable for review.

Both these review articles deal with topics of considerable practical importance in British agriculture. The first, by Dr. T. R. Preston, discusses recent work on high-energy barley diets for livestock feeding. It has been found that, with suitable management, beef cattle may be reared on a diet of 85 per cent of appropriately treated barley and a 15 per cent supplement containing protein, minerals and vitamins. Animals so fed gain weight in the form of lean beef surprisingly rapidly, and it was found possible to bring some dairy-type cattle to a good finish in 10-12 months instead of the usual 18-24 months. The régime, therefore, promises to be economic and profitable and has excited considerable interest among the farming community. It has been introduced into commercial practice, but the resulting meat has encountered some

criticism on the ground of taste and texture. Dr. Preston's article surveys the scientific background of this topical and somewhat controversial subject.

The other review, by Dr. E. Cresswell, deals with two topics both in connexion with sheep. The first is the problem of the premature dropping of the incisor teeth by certain sheep, more especially mountain breeds on particular diets. The causes of this curious defect have been rather obscure, and an account is given of investigations into the course of abnormal development of the teeth and the means which have been suggested to prevent or minimize the trouble. The second part of this article deals with the problem of providing suitable shelter for sheep during winter storms on mountains or other exposed places. Plans are given of a type of 'stell', which is relatively cheap to construct and which provides shelter for about 100 sheep and at the same time ensures adequate ventilation. Animals so protected are able to pass the winter on the more exposed mountain pastures and do not need to be brought to lower ground for protection from storm and cold.

In a section of the present report giving a brief survey of the past year, reference is made to the fact that in 1963 the Rowett Research Institute celebrates its Golden Jubilee (see *Nature*, 200, 201, 635; 1963). It was in 1913 that a joint committee of the University of Aberdeen and the North of Scotland College of Agriculture initiated its research programme on the nutrition of farm animals and appointed Dr. John Boyd Orr (now Lord Boyd Orr) to carry out this novel enterprise. The work on animal nutrition has gone on without interruption ever since, apart from dislocations due to two world wars. The contents of this report demonstrate how vigorously the organization then born has grown, and how it has justified and rewarded the efforts of the pioneers who created it fifty years ago.

W. O. KERMACK

\* Rowett Research Institute. Annual Report on Animal Nutrition and Allied Sciences. Vol. 19. Pp. 83. (Bucksburn, Aberdeen: The Rowett Research Institute, 1963.) 10s.

## THE MEDICAL RESEARCH COUNCIL

THE report of the Medical Research Council for the year 1961-62\*, which follows the general plan of this Council's previous reports, reflects, as they did, the trend of medical research as a whole. The volume and wide range of the work being done by the Council's staff and the practical applications of their work are indicated

by the fact that their publications have now become so numerous that it is no longer possible to list them in the report, although details of them can be obtained from the Library of the National Institute for Medical Research, Mill Hill, London, N.W.7.

Apart from the usual summaries of researches in progress, which occupies 140 pages of this report, and the details of the personnel employed by the Council, the report includes, as previous reports have also done, a

\* Committee of Privy Council for Medical Research. Report of the Medical Research Council for the Year 1961-1962. Pp. viii + 284. (Cmd. 2075.) (London: H.M.S.O., 1963.) 16s. 6d. net.