

and geological maps of twenty-one counties, published between 1819 and 1824. The map of Yorkshire has extraordinary detail for its time and is one of Smith's finest works.

Unfortunately, the cost of financing his publications proved too much for Smith, and in 1819 he was forced to leave London, where he had made his home since 1814. After a few unsettled years surveying in Yorkshire, Smith eventually settled in Scarborough but continued with professional engagements. For much of his life his work was unrecognized, but in 1831 he was rewarded by being the first recipient of the Geological Society's Wollaston Medal. In 1839, at the age of 70, Smith died while on his way to the meeting of the British Association in Birmingham.

This year, geologists also have the opportunity to celebrate the tercentenary of the publication of another important work in the history of geology—the *Prodromus of Nicholas Steno*, a book first published in Latin and later in an English translation in 1671. In it, Steno records his ideas about the origin of rocks, fossils and minerals. One of the few copies of the original edition in existence and the translation are on display in an adjoining exhibit in the museum.

AUSTRALIA

Minerals Still Boom

MORE opportunities for export, and increasing domestic demand, caused the continued expansion of the Australian mineral industry during 1967. Although the world increase in mining production was only 2.6 per cent, the figure for Australia was above 10 per cent and reflects the continuing buoyancy of the Australian economy as a whole. The mineral success story is described in the *1967 Review of the Australian Mineral Industry* (Bureau of Mineral Resources, Geology and Geophysics, Canberra, 1968).

Offshore exploration has continued to dominate the petroleum industry, and major discoveries—of both oil and natural gas—have been made during the year, mainly in the Bass Strait area. Completely new drillings are reported in the Gulf of Papua and on Ashmore Reef No. 1 in the Timor Sea. Total crude oil production in 1967 was more than twice that for 1966 and accounted for about 5 per cent of internal petroleum consumption.

As far as metals are concerned, the more important features of 1967 and early 1968 were the production of nickel and the regular export of iron ore from the Northern Territory—both for the first time. The discovery in 1966 of rich nickel sulphide ores at Kamalda, Western Australia, has led to nickel metal production which, combined with the expected outputs from other proposed developments, may soon allow Australia to become an exporter of nickel rather than an importer as at present. An added stimulus to this new venture is the present world shortage of nickel which shows little sign of changing.

The regulations governing uranium oxide export, which have always been strict, were changed in April 1967, mainly in anticipation of a tight domestic supply situation and because estimates made by the United States Atomic Energy Commission indicated that a three-fold expansion in world production to about 75 kilotons per year would be necessary by 1980. The

Ministry of National Development announced a scheme which gives permission in advance for the export of a certain proportion (depending on their size) of existing and new deposits; in this way supplies of uranium for future use in Australia will be assured and exploration simultaneously encouraged. The impact of fast breeder reactors on the market can only be guessed, but it will have to be taken into account when decisions affecting the supply of uranium after 1980 are made.

SOCIETIES

Mineralogists Integrating

THE Mineralogical Society, at a special general meeting to be held on November 6, will consider proposals put forward by its council which embody changes in the society's constitution, membership, publications and council. These proposals, although designed partly to increase income, are expected to enhance the coordination between the various branches of the society, and follow some changes which have already been introduced in publications and in the pattern of meetings.

At present, the society comprises ordinary and associate members, who receive the *Mineralogical Magazine*, *Mineralogical Abstracts* and the society's *Bulletin*, for a subscription of £5 per year. Membership of the Clay Minerals Group costs a further £1, and brings the group's Notices and *Clay Minerals*. Since the *Bulletin* includes Clay Minerals Group notices, separate publications of the group's circular will cease shortly.

It is proposed by the council that all subscription rates be increased to £6 per year, which will entitle every member to all the society's publications. This will have the double advantage of increasing income and promoting interest in the Clay Minerals section. In addition, there are proposals to revise the constitutions of the Committees on Applied Mineralogy and Geochemistry, together with that of the Clay Minerals Group, to place all these on the same basis.

Proposals for changes in the council, although not very sweeping, also highlight the trend in the society for integrating the various groups. The positions of retiring president, foreign secretary and managing trustees will be replaced by one representative from each of the Committees on Applied Mineralogy, Geochemistry and the Clay Minerals Group. The position of foreign affairs secretary will cease, and the management trustees, together with the treasurer, will constitute a finance committee.

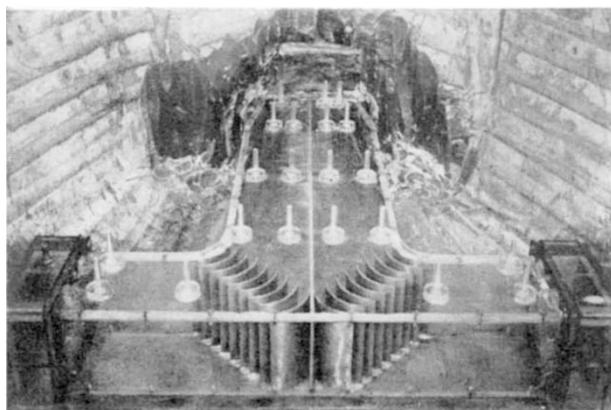
The additional income from subscription charges will, it is hoped, be used in the reorganization of *Mineralogical Abstracts*. To this end, the council is proposing that the general meeting considers the appointment of a technical editor and an assistant, together with the establishment of an editorial office outside London. The council is concerned that if these measures are not taken, the publication of *Mineralogical Abstracts* may not be possible in the near future.

RESEARCH AND DEVELOPMENT

Ideas for Industry

THE growing interest of the National Research and Development Corporation in the sea and the sea bed

as a source of industrial activity is emphasized in its thirty-fourth publicity bulletin, *Inventions for Industry*. NRDC has been looking at the problems of developing an effective industry capable of servicing oil, gas and civil engineering equipment as far down as the continental shelf—about 600 feet—and was able to show a large number of exhibits at the Oceanology International Exhibition early this year. One of the items was the manned sea bed vehicle being built by Cammell Laird which should be available commercially next year. It is designed to work in depths of up to 600 feet and will travel on the sea bed on large wheels powered through cables from a control ship. The development of accurate homing and navigation systems is important for all underwater operations, and with the Decca Navigator Co. NRDC has been reviewing existing techniques and planning possible apparatus including sonar devices with underwater telemetry and optical and low frequency radio instruments. It is hoped that other companies will be stimulated to take part in the development work.



The diverging duct arrangement fitted to the NPL model ship's stopping device.

An ingenious project which NRDC is currently supporting is the development by Imperial Chemical Industries, Ltd, of artificial seaweed to stop coastal erosion. Tufts of polypropylene tape, attached by nylon straps to an anchor chain, seem to reduce the energy of the waves and make them less destructive. Arrays are being sown in Bridlington Bay in Yorkshire to stop erosion of a boulder clay cliff, and on the Norfolk coast where a beach on the estuary of the River Blyth is being eaten away. Another basically simple but commercially successful invention is the Dracone, a flexible towable barge made of nylon fabric and cord, coated with synthetic rubber, which is being used to transport refined petroleum and oil products, drinking water and vegetable oils, very cheaply.

The National Physical Laboratory has developed and tested a stopping device for ships. The problem, highlighted by the Torrey Canyon disaster, is to slow down in an emergency a ship moving at full speed to a speed at which the reversed propeller is most effective. The NPL's system uses an arrangement of ducts to direct water from a high-pressure to a low-pressure region, destroying its backward momentum in the process, and experiments indicate that it should decrease stopping distances by about 35 per cent.

ATOMIC ENERGY

Isotopes for Everyman

WITH the Treaty on the Non-Proliferation of Nuclear Weapons in the offing, the International Atomic Energy Agency is preoccupied with the impact the treaty will have on its work and in particular on the safeguards agreements affecting member states. This is one of the new responsibilities which the International Atomic Energy Agency sees for itself, according to its annual report for 1968-69. The implementation of the Non-Proliferation Treaty is being anticipated by the agency in its programme for 1970; recruitment of new staff has begun and new safeguards and inspection instruments are being put through their paces. The agency also received a request to prepare a report on the international control of nuclear explosions for peaceful purposes for U Thant, secretary general of the United Nations.

But beside all this the IAEA continues its worldwide efforts to coordinate nuclear technology. Nuclear power and its applications to such problems as desalination of sea water are becoming an attractive proposition for developing countries, but the agency also pleads for smaller plants that would make capital costs less prohibitive. Four new reactors went critical in 1968; there will be another twenty-three in 1969, and a world nuclear capacity of 110,000 MW is forecast for 1975. Because of this the report stresses the need for continued and increased prospecting programmes for uranium, but it makes no mention of recent developments in the centrifugal purification of uranium fuels.

The agency has also ventured into information processing. Data produced by member states will be fed into a central file and fed back either on magnetic tape or as a typewritten account. The agency has drawn on the experience of EURATOM and plans to adopt much of EURATOM's thesaurus in setting up a keyword retrieval service. In the field the IAEA is devoting a generous part of its budget to the application of isotope technology to the life sciences. It is supporting such projects as the investigation of radiation-induced mutation to improve cereal crops, isotope tracer studies of the fate of pesticides, the use of sterile male insects in eradication programmes and research contracts on radioisotope applications in medicine. It is not, of course, possible for all requests for funds to be met, and with inflation and the delays of some member countries in meeting their contributions the agency has to turn down an increasing number of applications every year. In 1969 little more than one quarter of the requests for funds were successful. Nevertheless, between 1969 and 1970 the agency's outgoings are expected to increase by 9 per cent from \$11,251,000 to \$12,250,000.

AGRICULTURE

Farming Maps

NEW agricultural maps of England and Wales are one of the benefits resulting from using the Orion computer at the Rothamsted Experimental Station to analyse the data collected in the annual agricultural censuses. Not since 1941 has the Ministry of Agriculture published a comprehensive set of types of farming maps, but last year the ministry published a composite map of all