

permit. Both methods are required. The States of the British Commonwealth of Nations have many economic problems in common, and the need of some standing organisation to examine these problems has been repeatedly felt. Mr. Bruce, formerly Prime Minister of Australia, has suggested that some of the best minds available should be applied exclusively to these formidable tasks, particularly in view of the emergence of British agriculture as one of the great and growing agricultures of the Empire. Mr. Elliot greatly hopes that the work will be undertaken. But an organisation which holds within itself the possibility of just such a development—the Empire Marketing Board—has within the last few months been brought to an end. The failure of some of these attempts, the difficulties of others, do not exonerate us from the necessity for making fresh trials. Let us try marketing boards to cover the United Kingdom if we cannot get one to govern the world, if we cannot get one to span the Empire. In agriculture we are working on the lines of self-government in industry. We are trying to reconcile the producers and the customers, the industrial and the political aspects of the nation, which can no more be separated than the front and the back of a man's head.

Another Large South African Diamond

A DIAMOND of fine quality was found in January by Jacobus Jonker in South Africa in the Elandsfontein alluvial diggings on a tributary of the Pienaars River, near the Premier diamond mine and north-east of Pretoria. The weight is given as 726 carats (145.2 gm.). There is no evidence to support the suggestion that this new 'Jonker' diamond is the missing portion of the 'Cullinan' diamond, which was found in 1905 in the yellow ground in the wall of the Premier mine at a depth of 18 ft. beneath the surface. The 'Cullinan' weighed 621.2 gm. (3106 metric carats), and, as shown by the large cleavage surface, it was evidently only a portion (perhaps rather more than half) of a larger crystal. Diamonds sometimes become fractured during the eruption of the kimberlite magma into the pipes. Other large stones, but of doubtful quality, have been recorded from the Premier mine, namely one of 1640 carats in 1912, another of 1500 carats in 1919, and another of 1195½ carats in 1924. The first of these weighings would be against the English carat of 205.304 mgm., and the last two presumably against the metric carat of 200 mgm. The next largest stone is the 'Excelsior' found in 1893 in the Jagersfontein mine in Orange Free State, which in the rough weighed 199.04 gm. With the older diamonds there still exists an unfortunate confusion in the weights when expressed in carats. The re-cut 'Koh-i-Noor', usually listed as 106½ carats, weighs 21.786 gm. or 108.93 metric carats. A mass of carbonado (a compact aggregate of small crystals of diamond) found in Bahia in 1895 weighed 630 gm.

Sir Hans Sloane's Collections

A TEMPORARY exhibit of a selection of minerals and botanical specimens and books from the Sloane collections is now displayed in a lighted case in the

Central Hall of the Natural History Museum at South Kensington. It was these collections that formed the nucleus of the British Museum in 1753, and they contain many objects of considerable intrinsic value and of historic interest. A recent study of the voluminous MS. catalogues written by Sloane himself has led to the identification of many mineral specimens belonging to his collection. There is a good series of "pretious stones", including a magnificent Indian-cut sapphire weighing 31.5 carats, and a wonderful series of objects carved in agate, mocha-stone, carnelian, jasper, rock-crystal, nephrite, lapis-lazuli, etc. Most interesting are two drawers with the original labels from an old cabinet of minerals supposed to have medicinal virtues and listed as 'officinalis'. Sir Hans Sloane was a celebrated physician—it was he who certified the death of Queen Anne in 1714; and he succeeded Sir Isaac Newton as president of the Royal Society. One of the quaint entries in his MS. catalogue reads: "Lapis variolosus if hung about the Person makes the small Pox come favourable and hinders their being mark'd from its Signature". The Sloane collections were formerly in the old Manor House of Chelsea (built by Henry VIII), and his memory is preserved in a dozen streets, places, and squares named Hans or Sloane.

Indian Earthquake of January 15

A BRIEF notice of this great earthquake, based on the earliest reports, was inserted in our last issue (p. 94). Later accounts add considerably to the first estimates of the loss of life and of the extent of the disturbed area. It is clear that the number of deaths will amount to several thousand—in Monghyr alone, 4,000 are reported as killed. The epicentre, given by the seismographic records at Kew and Bombay, lies in lat. 26.8° N., long. 86.3° E., or a short distance to the east of the towns (Patna, Muzaffarpur, Monghyr, etc.) which suffered most from the earthquake. Thus, it would seem that the crust movement started a few miles east of Darbhanga and spread rapidly westwards for fifty miles or more. The distances from the epicentre of some of the places from which reports of the shock come are so great that it is only their close grouping that justifies their acceptance. Bombay is about 970 miles from the epicentre and Madras 980. Still farther to the south, and somewhat isolated, are Madura (1,250 miles) and Aleppey in Travancore (1,330 miles). If we assume the disturbed area to be bounded by a circle passing through Madras, it would contain three million square miles. The area included within the isoseismal of intensity 4 of the Kansu earthquake of December 16, 1920, was about 2½ million square miles, so that the area actually shaken must have been of the same order of magnitude as that disturbed by the recent earthquake.

Early History of the Reverberatory Furnace

At a meeting of the Newcomen Society held on January 17, Mr. Rhys Jenkins read a paper on "The Reverberatory Furnace with Coal Fuel, 1612-1712". The term reverberatory, he said, came from the Low Latin "reverbero", to beat back; to-day, by reverberatory furnace, we mean one in which the

material under treatment and the solid fuel are kept apart, and the flame and hot gases from the burning fuel enter the furnace proper at one end and are deflected or beaten down on to the material on the hearth by the roof of the furnace. The earliest account of such a furnace was given by Theophilus the monk, who wrote in the eleventh century. It was used for making glass. Early in the sixteenth century reverberatory furnaces were used in Germany for melting bronze for guns, but Agricola in his "De re metallica" makes no mention of them. The earliest description in the English language of a reverberatory furnace was found in a work published in 1613 by John Rovenson, while the earliest drawing of any value of a coal-burning reverberatory furnace was given by the German metallurgist Schlüter in his "Gründlicher Unterricht von Huttenwerken" of 1738. During the seventeenth century the smelting of lead, copper and iron in reverberatory furnaces was attempted by various individuals at several places; the furnaces being generally without chimneys. An interesting point was when it was recognised that with a closed fireplace the air required for the combustion of the fuel could be drawn through by a chimney. The first record of the use of chimney draught is contained in Glauber's work of 1646 "Furni novi Philosophici", translated into English in 1651.

Petrie Portrait Fund

THE retirement of Sir Flinders Petrie from the Edwards professorship of Egyptology at University College, London, has seemed to many of his friends an appropriate occasion for an expression of appreciation of his lifelong services to archaeology. It is thought that this might most appropriately take the form of his portrait, to be presented to the College with which he has so long been associated. An appeal for funds for this purpose has been issued over the names of Prof. J. H. Breasted, M. J. Capart, Dr. Howard Carter, Prof. F. Ll. Griffith, Sir George Hill, Sir Henry Lyons, Dr. Allan Mawer, Sir Robert Mond and Dr. Margaret Murray. In issuing the appeal, it is pointed out that it is now more than fifty years since Sir Flinders began work as an archaeologist at Stonehenge, and soon afterwards carried out the first accurate survey of the Pyramids at Gizeh. Referring to his influence on archaeological studies during his long career as an excavator, the committee states no more than the bare truth when it points to his insistence on accurate observation and recording, and the stress he has laid on the significance of smaller finds, equally with the larger, in an excavation, in developing knowledge of the social conditions of the past. The appeal also refers to his early recognition of the importance of correlation in studying the intercourse between the various peoples of the Near East from earliest times. Finally, in attributing to him in large measure the awakening of modern interest in archaeology, mention is made of the great number of archaeologists who have achieved distinction after receiving their training and inspiration from him as lecturer and excavator. Subscriptions towards the fund will be received by Sir Henry

Lyons, F.R.S., 3 York Terrace, Regent's Park, London, N.W.1.

Infra-Red Photography as an Aid to Navigation

THE United States liner *Manhattan* has recently been fitted with a special look-out camera intended for an investigation of fog penetration with infra-red sensitive materials. Mechanism for the automatic developing and fixing of the photographs is included in the body of the camera itself, and the photographic record may be viewed one minute after the exposure has been made. The weather conditions encountered by the *Manhattan* since the new apparatus was installed have not been suitable for experimental work, so no records obtained under service conditions are yet available. The problem of fog penetration is not at all simple, and it remains to be seen whether the degree of penetration actually obtained by this method will be really helpful to navigators.

The Gases of the Atmosphere

IN his presidential address before the Royal Meteorological Society at its annual general meeting on January 17, Prof. S. Chapman discussed "The Gases of the Atmosphere". The permanent gases of the atmosphere (mainly nitrogen and oxygen) are known, from direct measurements in the stratosphere, to be in constant proportions up to the greatest heights yet attained by Piccard and his successors in stratospheric flight. Other constituents vary in their concentration, because of processes tending to produce and destroy or transfer them in the atmosphere: among such constituents are water, ozone and the newly discovered positrons, which enter the atmosphere from outside as cosmic rays. Experiments were suggested to determine the rate of large-scale transfer of such gases by turbulence, using some easily detectable gas, artificially introduced, as an 'indicator'. Such experiments might also be made using ozone as the indicator, which would throw light on the distribution of ozone, as recently estimated by Dobson, Götz and Meetham. The possibility of removing the atmospheric ozone above certain ground areas was also considered. The absorption of solar radiation by oxygen and ozone was discussed in the light of new experimental data, and in relation to the composition and temperature of the upper atmosphere.

London's Underground Railways

By the formation of the London Passenger Transport Board last year, the unification of the underground train, bus, trolley-bus and tram systems of London has been accomplished. The British Electrical and Allied Manufacturers Association (Beama) has recently published a well-illustrated book giving an account of the part played by British manufacturers in providing machinery and equipment for this great transport service. The account given proves the sound administrative qualities of those who have made London's 'Underground' the foremost institution of its kind in the world. So far back as 1846, the prospectus which led to the foundation of the