that the *guarantee* should be increased to 8*d*. a gallon and remain in operation until 1950, and that it should be extended to include diesel oil used in motor vehicles.

It might be feared that this extension would involve a loss of revenue, but the consumption of oil and motor spirit is increasing so rapidly that any expansion of the various industries producing oil from coal would probably, at most, only provide for the increase, and could take place without reducing the present imports.

The Committee includes in its report a very welcome discussion of the position in time of war, and this probably forms its most valuable contribution. Much confusion has arisen in the past from the statements of parties interested in particular processes, or from well-meaning individuals who have based their deductions on incomplete knowledge. Even should carbonization processes expand to a degree wildly in excess of anything at present appearing commercially practicable, the supplies of motor spirit forthcoming would form only a small fraction of those needed in times of national emergency. The only methods which can be looked to as potential sources of large supplies of oil are hydrogenation and the Fischer or similar synthetic processes, where oil is the main product and is independent of the markets for coke and gas.

At present, only about 7 per cent of the motor spirit consumed in Great Britain is home-produced, and the home production of fuel oil, lubricating oil, etc., is negligible. An enormous expansion, involving the erection of many large plants, with consequent heavy capital expenditure, would thus be required to meet even peace-time demands. If such plants were put into operation, the consequent decrease in imported oil would eventually result in a considerable diminution of our sea transport facilities and make the possibility of import during war much more difficult. Moreover, large oil production plants would be extremely vulnerable to air attacks; and the man-power and supplies of coal needed for their operation, although an advantage in times of peace, might not be easy to provide when the fighting and munitions supply services were demanding all the men available. An interesting comparison is made between the capital cost of a plant with a yearly output of 150,000 tons of motor spirit (about £8,000,000) and the thirty-two tankers which could be built for the same sum, which, even if making only five voyages yearly, could carry 1,800,000 tons, or twelve times the output of the hydrogenation plant.

For these and other reasons, the Committee confirms the opinions already formed by those who have studied the subject impartially, that "in general a policy of depending on imported supplies with adequate storage is the most reliable and economical means of providing for an emergency".

Although in general agreement with the remarks of the Committee concerning low-temperature carbonization, the writer thinks it a pity that evidence in this field should have been taken only from the Low Temperature Distillers' Association of Great Britain, Ltd. In a subject which is still so experimental as low-temperature carbonization, an association of this character cannot be altogether representative, for, since it is not likely to welcome newcomers to introduce additional competition, much valuable data must be withheld from it. The Committee has, however, doubtless been in close touch with the Government Departments concerned in the matter.

C. H. LANDER.

Archæological Discovery in Britain, 1933-38

IN arranging an exhibition at the Institute of Archæology of the University of London to illustrate the achievement of field archæology in Great Britain and Northern Ireland during the five years 1933–38, the promoters have provided a conspectus of results which is continuous with those of the two exhibitions of a similar character held in 1929 and 1932, the latter in conjunction with the International Congress of Pre- and Proto-historic Sciences, which met in London in that year. The inevitable comparison demonstrates the very considerable advance made by archæological studies in the interval, and its direction.

The most striking feature in such a comparison is the increase in size of the present exhibition. This is not merely a matter of the total of exhibits, but also extends to the number of sites represented. For this the more efficient organization now possible is in part responsible; but unquestionably the decisive factors have been the growing activities of archæologists, and in no small degree an increased and more widely spread interest among a public which is prepared to support archæological excavation, financially and otherwise. For this part credit must be allowed to the Office of Works, which in the exercise of its statutory duties has

stimulated local authorities, local museums, local societies and a local public to preserve their ancient monuments, or where that has been impossible, to obtain from them such information relating to the past as they can be made to render up by skilled investigation before the evidence is obliterated. Among the more salient instances of such interest, of which the results are to be seen here, is the Old Jewry Wall site at Leicester, and the Belgic and Romano-British site at Colchester, whence comes the notable evidence of the factory of 'Colchester' ware, or local Samian.

Dr. R. E. Mortimer Wheeler, director of the Institute, in a short but illuminating introduction to the catalogue of the exhibition, regards it as demonstrating the extension of archæological field-work to provinces other than the Romano-British studies which, following the pre-War Haverfield tradition, dominated the early post-War years. This, no doubt, is true in some measure, but needs qualification. What is especially notable is not so much the change in the orientation of archæological studies as the increase in the number of professional or highly trained archæologists, whose interests and services are now available for investigation in the wider field, which previously was not so much neglected as for a variety of reasons left to the investigator who, though experienced and frequently of advanced technical skill, was not professionally trained. The effect of this change in the qualification of personnel is to be seen on all sides. Without risking invidious distinction, mention may be made of instructive examples in the mesolithic exhibits from Sussex, in which there is profound knowledge and trained experience behind the arrangement and classification of the finds from the pit-dwelling site at Selmeston, unique at present in British scientific investigation, and of the Tardenoisian industry from Horsham, for both of which Dr. J. G. D. Clark is responsible. The work undertaken by Mr. Alexander Keiller and the Morven Institute of Archæological Research at Avebury lends further support to the contention, as also does the material drawn from bronze and early iron age sites in Sussex, Gloucester and Wales.

It is a further mark of the trained habit of mind that help from other sciences is being sought in an increasing degree to give objectivity to the findings of the archæologist. The evidence of geology and palæontology on broad lines has always served the excavator; but to this are now added intensive investigations in geology, climatology, palæobotany, which call for the employment of laboratory methods. Prof. F. E. Zeuner, the distinguished authority on prehistoric chronology, who is now attached to the staff of the Institute, stages an exhibit of the methods of geochronology, in which he shows how mechanical and chemical analysis of soils and gravels can be made to show changes of climate and geological conditions, and demonstrates the tree-ring method of time measurement, which has been used extensively in American archæology. Two interesting and instructive examples of the use of analysis and experiment in field work appear among the exhibits from archæological sites. The first comes from Wales and establishes the earliest recorded use of coal as fuel in Britain in a bronze age cremated urn burial from the Simonston Cairn, near Bridgend, Glamorgan, excavated by Sir Cyril and Lady Fox. The second is included in material, also from Wales, excavated by Mr. B. N. St. J. O'Neil from Fridd Faldwyn Camp, Montgomery. It is an example of vitrification, which is compared with similar vitrified rock from a hill-fort in Bute, and also with vitrified material experimentally produced by Mr. Wallace Thorneycroft, who has thus solved a puzzle of long standing among Scottish archæologists.

Before leaving the subject of archæological technique, attention may be directed to the nucleus of a collection of photographs taken from the air for which Major G. W. G. Allen is responsible. Such photographs are now familiar as an instrument of survey and discovery; but the technique of ground photography is less widely appreciated. Enlarged photographs arranged by Mr. M. B. Cookson illustrate the varied points of technical detail recorded by skilled manipulation of the camera. Technical considerations apart, the photographs of interments of the defenders of Maiden Castle, Dorchester, are intensely impressive; while those of the recently reported investigation of the methods of construction of Hadrian's Wall are of special interest at the moment.

Finally, as an example of more or less straightforward excavation, carried out with a patience that is unlimited, which are the fundamentals of archæological method, reference may be made to Mr. A. Leslie Armstrong's excavation of the Pin Hole Cave, Creswell Crags, Derbyshire, in which twelve years' work has penetrated through twenty feet of deposits and has brought to light relics of three phases of Mousterian, separated by two glacial phases or events, of Solutrean and of Aurignacian, the last including an engraving of a man masked for a ceremonial dance unique in Britain.

It may seem that in directing attention to the more salient features of the exhibition, which mark progress and direction in British archæology, too little has been said of individual exhibits. This is not due to any lack of interest. While there is no section which does not repay study, those

which cover the early iron age and more particularly the period immediately before the Roman invasion, open up a field which a few years ago was unmapped. All sections alike in quality and number of exhibits testify not only to the skill of the investigators, but also to the value of this branch of scientific research in Britain as a source of material for the advancement of knowledge of man's cultural development and history.

Dr. Wheeler points out that recent development in archæological studies implies an elaboration of technique rather than a change of heart, while the position of General Pitt-Rivers as the founder of scientific archæology remains unchallenged. So long as this obtains, there is the less need for Dr. Wheeler's admonition to the archæologist to bear in mind that he is not merely a mechanic, but is also a student of humanity. If there be any danger, Dr. Wheeler's own excavations of Verulamium and Maiden Castle, which hold an outstanding position in the exhibition, spur his colleagues to emulation and guide them along the right path.

Obituary Notice

Sir Harcourt Butler, G.C.S.I., G.C.I.E.

BY the death of Sir Harcourt Butler, termed one of the greatest administrators in India of his day, which took place on March 2 at the age of sixty-eight years, oriental studies in the University of London have lost one of their strongest supporters.

Spencer Harcourt Butler was the second son of Mr. Spencer Percival Butler, conveyancing counsel to the Office of Works, a nephew of Dr. H. M. Butler, Master of Trinity College, Cambridge, and a brother of Sir Montagu Butler, now Master of Pembroke College, Cambridge. Born on August 1, 1869, Harcourt Butler was educated at Harrow and Balliol College, Oxford. He passed into the Indian Civil Service in 1888 and went to the United Provinces of Agra and Oudh, where he remained and served with conspicuous success until 1907, when he was chosen by Lord Minto to act as secretary of the Foreign Department, an office which brought him into close personal touch with the native princes. In 1910, Butler was appointed to the newly created post of education member in charge of sanitation, local self-government, archæology and other minor branches of public works. Butler took up the administration of these heterogeneous activities with vigour.

In 1915, Sir Harcourt (as he had become three years before) was transferred to Rangoon as Lieutenant-Governor of Burma. One of his early achievements was to raise a substantial sum for the provision of a teaching university in Rangoon to take the place of the colleges previously affiliated to Calcutta. In 1917 he returned to his old Province to take office as lieutenant-governor; but in 1923 he returned to Burma to become Governor under the new system inaugurated in 1919.

Butler's activities during this second term of office in Burma have met with criticism in two directions. He had already shown enthusiasm for education both in Rangoon and previously in India, where he had encouraged the foundation of universities at Benares for Hindus and at Aligarh for Moslems; while in his time in Oudh the University of Lucknow had been created and the University of Allahabad had been reconstructed. On his return to Rangoon, he found that his scheme for a university was languishing. He brought forward fresh legislation, and schemes were framed for raising money. Both measures met with much opposition and even aroused some personal animosity.

In another direction, Butler's actions have been regarded as not in the best interests of those he intended to serve. This was the abolition of slavery and human sacrifice in the land of the savage Nagas known as the Triangle, the then unadministered territory bordering on the Hukwang Valley. Butler was successful in stamping out these practises; but while they are repugnant to civilized ideas and not permissible under British administration, the anthropologist has to recognize that the abolition of slavery, at least without adequate substitute, economically has had a damaging effect in forcing land out of cultivation and reacting adversely on the morale of the tribes.

On leaving Rangoon in 1927, Butler was appointed chairman of the Indian States Committee to report on the relationship between the Paramount Power and the States. The report issued in 1929 proved a standard of reference on the question of federation in the Round Table Conference which followed.

On his return to England, among numerous other activities Butler accepted in 1931 the chairmanship of the Governing Body of the School of Oriental Studies, and took a prominent part in the arrangements for the new quarters of the School in Bloomsbury, now approaching completion. Among the numerous honours bestowed upon Sir Harcourt Butler were honorary doctorates from the University of Oxford and several of the Indian universities.

WE regret to announce the following deaths:

Mr. E. A. S. Fawcett, C.B., chief engineer to the Ministry of Health from 1921 until 1930, on April 1, aged sixty-nine years.

Mr. Edward Meyrick, F.R.S., assistant master at Marlborough College from 1887 until 1914, an authority on Australian Lepidoptera, on April 1.

Mr. T. H. Digges La Touche, formerly of the Geological Survey of India, on March 30, aged eighty-two years.