has since appeared in the Bagdad paper *el Bilad* evades this issue. Dr. Woolley goes on to show specifically in detail that the Antiquities Department of Iraq, having first choice, was in a position to, and did, select the most valuable and finest specimens for its proportion of the finds, without any compensation being given to the Expedition. The law is interpreted in such a way that there is a danger that the share of any Expedition may become insufficient to justify the expenditure entailed by the work of excavation. The reduction of the number of expeditions in this field to three indicates that this view is only too well founded.

Artificial Lighting at the National Gallery

ON and after April 1 the public will be able to visit the National Gallery, Trafalgar Square, until 8 p.m. on three evenings in the week. This has been made possible by a new lighting scheme, which has been the subject of extensive research during the past six years. The installation has been designed to secure a reasonably high intensity—about 4 foot-candles—upon the pictures themselves, and at the same time to prevent too great a feeling of darkness over the remainder of the room. Suspended fittings, each containing a high-powered frosted bulb, are used, and a system of louvers and reflectors directs as much light towards the picture-carrying portion of the walls as the architecture of the several rooms will permit. The height of the fittings has been calculated upon the assumption of a viewing distance of eleven feet from the walls. Masks are employed to stop the glare in the direction of doorways: in the majority of cases this has proved satisfactory, though instances will always arise when the geometry cannot be satisfied without producing a shadow on the wall or in a corner. An emergency system of lighting, which comes into operation automatically in case of failure, is held in reserve.

International Vitamin Standards

THE International Standards for vitamins A, B_1, C and D are now available for issue to laboratories, institutions and research workers in Great Britain and Northern Ireland. These standards were accepted for international use at the Second International Conference on Vitamin Standardisation held in London in June 1934 under the auspices of the Permanent Commission on Biological Standardisation of the Health Organisation of the League of Nations. The Conference recommended that they should be kept at the National Institute for Medical Research, Hampstead, N.W.3, which would act for this purpose as the central laboratory on behalf of the Health Organisation of the League of Nations. The standards for the vitamins B_1 and D remain unchanged, and their supply at regular half-yearly intervals will be continued as before. The standard for vitamin A has been changed; a pure specimen of β-carotene having been adopted in place of the impure preparation of carotene hitherto employed. The unit of vitamin A remains unchanged, though it is now defined as the vitamin A activity contained in 0·6 microgram of pure β-carotene. In accordance with the recommendations of the Conference, the β-carotene is issued in the form of a solution in oil, of which 1 gm. contains 500 international units. The quantity of this standard solution supplied to each applicant is approximately 5 gm., and, on account of the small quantity available, it can be supplied only at yearly intervals, and not half-yearly as formerly. *l*-Ascorbic acid has been adopted as the international standard for vitamin C, the unit of activity being defined as the vitamin C activity contained in 0·05 mgm. of pure *l*-ascorbic acid. A fuller account of the recommendations of the Conference on Vitamin Standardisation appears elsewhere in this issue (p. 516).

Chemical Engineering in Industry

GREAT BRITAIN is awakening to the importance of the chemical engineer, a man who knows the nature and properties of the new constructional materials or is able to design large plants for the continuous production of those materials which are classed as chemicals. It is at least likely that the big developments in the future will be among the chemical industries making, at a low price, substances for which there is a considerable need, almost automatically as a continuous process. Such will require the ablest chemical engineers to design and operate them. There are two societies active in promoting the subject and in bringing together those who practise it, and post-graduate courses are provided in several of the London colleges. Greater progress in chemical engineering has been made abroad, particularly in the United States and in Germany, and for some time past the desirability of holding an international congress has been realised by those interested, in particular by the late Sir Frederic Nathan. Thanks to the assistance of the World Power Conference with its widespread organisation, a Congress has now been arranged, to take place in London on June 22–27, 1936. The programme, which has just been issued, lists the influential members of the organising committees, whose names are a guarantee of the support the Congress is receiving. It further indicates the scope of the projected programme: this covers plant, fuel and heat and general problems, administration, development and general aspects of the subject. It is desired that the papers, while adhering strictly to chemical engineering, should deal as fully as possible with the economic aspect of the subject. The Committee aims at inviting technicians of repute to present papers dealing with particular aspects of these subjects rather than having a miscellaneous collection of papers, and if they are successful the Congress should be a memorable one.

Dr. William Derham, F.R.S. (1657–1735)

ON April 5, the bicentenary occurs of the death of Dr. William Derham, rector of Upminster, Essex, and for thirty-three years a fellow of the Royal Society. Born at Stoughton, near Worcester, on November 26, 1657, he entered Trinity College,

Cambridge, in 1675 and took holy orders. In 1682 he was made vicar of Wargrave, Berkshire, but seven years later was appointed to Upminster, where he spent the remainder of his life and where he is buried. Derham united a sincere devotion to his calling with a passion for mathematical and philosophical studies. Elected a fellow of the Royal Society in 1702, he contributed papers to the *Philosophical Transactions* on the motion of the pendulum in a vacuum, on sound, sunspots, Jupiter's satellites, the aurora borealis and other subjects. His separate writings included his "Physico-theology", 1713; and his "Astro-theology", 1715; while in 1726 he edited "The Philosophical Experiments . . . of Robert Hooke and other Virtuosoes". He was made a canon of Windsor, and in 1730 the University of Oxford conferred upon him the degree of D.D. for his services in the cause of religion by his culture of natural philosophy.

Lead Mining in the Northern Pennines

THE history of lead mining in the Tyne, Wear and Tees areas during the eighteenth and nineteenth centuries was described by Dr. A. Raistrick before the Durham Philosophical Society on March 15. Two companies have worked practically all the mines in these areas, the London Lead Co. and the Beaumonts. The former began with a charter granted in 1692 to a company formed in Bristol to attempt the smelting of ore with coal. This venture closed after two years, but two Quakers, Edward Wright and John Haddon, of London, obtained the reversion of a much older charter (of 1654) of the Society of Mines Royal (Copper), a German concern formed to work Cumbrian ores. Wright seems to have invented the reverberatory furnace, long called the cupola from its shape, and found that it was very suitable for lead refining. They extracted silver, and with some Newcastle Quakers founded a smelt mill at Ryton-on-Tyne in 1704; before that (from 1696), difficulties with the oath it contained prevented their taking up the 1692 charter, but these were overcome in 1704, when the accumulated silver was sold to the mint. This company, long known as the "Quaker Lead Company", until 1730 had an output of about 150 oz. of silver a week, and in 1705, Sir Isaac Newton then being Master of the Mint, they were granted a mark which appears on most of Queen Anne's coinage until 1737. The maundy money was coined from their silver for another hundred years. They bought ore from Alston Moor, and worked lead also in Flintshire, and finally in Yorkshire, Scotland, Ireland and the Isle of Man. The tale is too long to repeat here, but the Pattinson process of desilverisation was discovered at Blaydon in the Beaumont works. The two concerns worked harmoniously together, and many improvements were made by the London Lead Co. In 1860, the decline set in, the company surrendered all its leases in 1907; and now only three mines are working under the new Weardale Lead Co., and those recently closed will never re-open. An interested visitor at the lecture was the last manager of the old company.

Speed in Aviation

IN his Friday evening discourse delivered at the Royal Institution on Friday, March 22, Prof. B. Melvill Jones discussed the problems of speed. The speed of aerial transport is limited solely by the power which can be provided to drag the aeroplane through the air, without reference to its support; the power required increases very rapidly with speed, but can be much reduced by good stream-lining. The recent increases in speed of civil air transport are due mainly to improved stream-lining. With well stream-lined aeroplanes the power is expended mainly in overcoming skin friction, so that the detailed study of the skin friction on the curved surfaces of the wings and body merits, and is receiving, great attention by research workers. The magnitude of the skin friction force is delicately dependent on surface smoothness and on the smoothness or otherwise of the flow very close to the surface of the wings and body. After perfect stream-lining, in the ordinary sense, has been achieved, still further important increases in speed would follow from any considerable extension of the area over which the flow remains smooth very near to the surfaces of the wings and body; but to obtain this smooth flow over large surfaces moving at high speeds may be very difficult, and it is still a matter for conjecture how much of the great increase of speed which might conceivably be obtained in this way will ever be realised in practice.

Recent Acquisitions of the Natural History Museum

THE Department of Entomology has received from Mr. R. W. Lloyd a gift of drawings of quite exceptional interest and value. These consist of the original coloured plates prepared by Jacob Hübner for his "Collection of European Butterflies", published during the years 1796–1830, at Augsburg in Germany. There are 852 plates in all, a number which exceeds that of the published work by many cancelled and amended copies. Concerning the identity of some of the smaller insects illustrated there has long been doubt; it is hoped the comparisons which it will now be possible to make between the originals of these figures and the material available in this Department will enable most of these doubts to be removed. It is interesting to note that until a few weeks ago it was unknown in Great Britain that these drawings even existed. The Department of Geology has recently acquired from Dr. Wyatt Wingrave a large collection of fossil invertebrates (chiefly Ammonites) from the Lias and Inferior Oolite of the Dorset district. A crystal of gem olivine (peridot) from Burma has been purchased for the Department of Minerals. Presents to the Department include a fine group of large crystals of wolframite from Pelagatos Mountains, Peru, collected by the late Prof. J. W. Gregory and presented by Mrs. Gregory.

THE Department of Botany has received a collection of dried plants made in Twaong (Tibet) and Bhutan by Messrs. G. Sherriff and F. Ludlow. There are 523 flowering plants and 53 cryptogams, which are