

the electrical section was evacuated from Berlin to Thuringia. Considerable work was done on crystal clocks of high precision, and standard frequencies were distributed both by telephone line and by radio transmission. Towards the end of the War, the Reichsanstalt did some work on centimetre and millimetre wave-lengths, including the frequency comparison of cavity and line wave-meters. Altogether, the exhibition has served a very useful purpose, in bringing to the notice of scientific and technical workers in Great Britain an appreciation of the state of German research and development in the field of electronics during the war years.

#### Education in the British Army: Major-General Cyril Lloyd, C.B.E.

RECENT changes at the War Office have led to speculation about the future of Army education. The former director-general, Mr. P. R. Morris, has taken up his post as vice-chancellor of the University of Bristol, while Mr. W. E. Williams, the former director of the Army Bureau of Current Affairs, has been appointed director of a corresponding civilian organisation, the Bureau of Current Affairs, which has been set up by the Carnegie United Kingdom Trust. The position at the War Office has now been clarified by the announcement that Major-General Cyril Lloyd—to whom we offer congratulations on his promotion—has been appointed director of Army education. The directorate of Army education and the Bureau of Current Affairs have now been merged into one directorate over which General Lloyd will preside.

General Lloyd is a graduate of University College, London, where he took a first-class honours degree in physics and mathematics. After a period of post-graduate research at Cambridge, he was appointed senior science master at Brighton Grammar School. His record during the War has been particularly distinguished and led to his appointment as Deputy-Adjutant-General with 21st Army Group under Field-Marshal Montgomery. For his services in the Normandy campaign he was invested with the C.B.E. while in Holland. In December 1944 he was recalled to Great Britain and appointed director of Army education at the War Office. Men of science will be pleased to hear of his recent promotion and will be glad to know that the War Office have entrusted the future of Army education to a young officer who, by his record as a soldier and as an educationist, has shown his capacity to shoulder heavy responsibilities with courage and resolution. Both qualities will be needed in General Lloyd's new post.

#### British Institution of Radio Engineers: Lord Louis Mountbatten

LORD LOUIS MOUNTBATTEN has been elected president of the British Institution of Radio Engineers for 1946-47. Admiral Mountbatten has specialized in radio since 1925. He served as senior wireless instructor at H.M. Signal School (1929-31), and was responsible for the writing of the first Admiralty Handbook on Wireless Telegraphy sets, and also supervised a new edition of the Admiralty Handbook on Wireless Telegraphy. To encourage the training and education of radio engineers, Admiral Mountbatten established in 1939 a "Mountbatten Medal", to be presented to the most outstanding candidate of the three Services successful in the graduateship examination of the British Institution of Radio Engineers.

#### International Meteorological Organisation

THE International Meteorological Organisation met in London during the week beginning February 25 for its first post-war conference. Some eighty delegates, consisting of the directors and members of the meteorological services of forty-six nations, were in private session under the chairmanship of Dr. Th. Hesselberg, president of the International Meteorological Committee since 1935. Dr. Hesselberg is the director of the Norwegian Meteorological Service. The first task of the conference was to re-form its various committees and technical commissions, and to fill the numerous vacancies in these bodies which had occurred since the last meeting of the Organisation in Berlin in May 1939. Six regional commissions were also formed, partitioning the whole world; each commission covers broadly a continent and its adjacent ocean areas. The new machinery thus set up has been given instructions and guidance for adapting to peace-time purposes the many developments in procedure and technique which have been evolved during the war years. The primary object in view has been to meet the requirements of long-distance flights by civil aircraft, and to see that the full resources of modern meteorological science are made available as quickly and effectively as possible to ensure the safety and regularity of airlines operating on the international routes. Next year, the International Meteorological Organisation plans to hold meetings of all its commissions in Toronto, to be followed by a conference of directors and a meeting of the International Meteorological Conference in Washington. At the close of the London conference, Dr. Hesselberg retired from the presidency of the Organisation, and Sir Nelson Johnson, director of the Meteorological Office, London, was elected as his successor.

#### British Association Meeting for 1946

THE British Association has found it impossible to arrange this year an annual meeting on the lines of the pre-war meetings in provincial cities. A one-day meeting will therefore be held on July 20 in London. The British Medical Association has generously granted the use of its hall for this occasion. The presidential address will be delivered by Sir Richard Gregory. There will be no sectional meetings. Opportunity will be taken to receive delegates attending the Empire Scientific Conference organised by the Royal Society, and the Commonwealth Scientific Official Conference, at a luncheon on July 20 and at the subsequent meeting, and also, it is hoped, at a Sunday afternoon reception at Down House, the home of Charles Darwin. It is also hoped to receive some of the foreign delegates who are expected to be in England at that time. It is intended to resume normal meetings in subsequent years, and an invitation has been accepted for the meeting in 1947 to be held in Dundee, where the meeting in 1939 was cut short by the imminence of war. An invitation from Brighton for 1948 has also been accepted.

#### Water Supply and Food in India

IN a pamphlet entitled "Food and Irrigation Problems affecting India in General and Bombay in Particular", Rao Bahadur N. S. Joshi discusses ways of meeting the estimated requirements of 1971. He is concerned mainly with the engineering aspects of the irrigation presumed to be needed; and though the nutritional discussion is mainly in terms of crop

area and tonnages, the need for improved diet is not neglected. On account of the great distances, a general transfer of food from 'surplus' to 'deficit' provinces is impracticable. The solution is, in the author's view, a great increase in irrigation; but in Bombay it is not possible to extend greatly the kind of barrage-and-canal irrigation that has been a spectacular success in the river-plains regions. The pamphlet may be regarded as a reasoned critique of canal irrigation. Contour cultivation (bundling) may increase yields in hilly areas, but the crops suitable for upland cultivation are grains of low nutritional value, of which Bombay normally has a surplus; and contouring is incompatible with storage from catchments. The ultimate solution for Bombay Province, therefore, is a very great increase in the number of small wells. The author suggests how these might be planned and financed, and in addition he shows how barrage and water-storage schemes could be provided so as to make the greatest possible use of all water resources. The pamphlet is stimulating, and has much value as a source of information regarding the current status and economics of irrigation and food-production in various provinces of India. The reader is left with the feeling that the main difficulty is social rather than engineering.

#### Horticultural Uses of D.D.T.

A USEFUL short paper by G. Fox Wilson (*J. Roy. Hort. Soc.*, 71, Pt. 1, January 1946) gives some timely results with the use of D.D.T. for controlling various garden pests. This substance has no egg-killing properties, is useless against red spider and other acarine mites, and has no useful action against aphids. Spectacular control of numerous pests is reported, however, notably of the apple blossom weevil and of the greenhouse thrips (*Heliothrips haemorrhoidalis*). The unselective action of D.D.T. can be a danger, for ladybirds and other predators are killed along with the pests. Use of the substance as a larvicide in garden ponds may be a very mixed blessing for other and more desirable members of the fauna. Hive bees and other pollinating insects are destroyed by untimely applications. It is very obvious that D.D.T. must be used with care, and under expert advice, until its wide implications are thoroughly investigated.

#### Arsenic in Tobacco Smoke

THE presence of arsenic in the smoke of some kinds of tobacco is the subject of an annotation in the *British Medical Journal* (94, Jan. 19, 1946). Remington (*J. Amer. Chem. Soc.*, 49, 1410; 1927) found that about half the arsenic present is volatilized when tobacco is smoked, and Gross and Nelson (*Amer. J. Pub. Health*, 24, 36; 1934) showed that 15-40 per cent of it goes into the smoke. Thomas and Collier (*J. Indust. Hyg.*, 27, 201; 1945) found wide variations in the arsenic content of different brands of tobacco. In the puffed smoke of the cigars used for their experiments they found 0.2-3.0 mgm. of arsenious oxide, in that of the pipe tobacco examined 1.7-5.7 mgm., and in that of the cigarettes 3.3-10.5 mgm. The cigars themselves, however, contained less arsenic than the pipe tobacco or cigarettes. H.M. Chief Inspector of Factories, continues the annotation, in his annual report for 1943 (Cmd. 6563, H.M. Stationery Office, 1944) recorded three cases of carcinoma of the lung since 1939 in arsenical sheep-dip workers and referred to the high incidence of this

disease in arsenic workers, a problem which is being studied by the Medical Research Council. There appears to be strong evidence that arsenic dust predisposes to carcinoma of the respiratory tract. The carcinogenic properties of the arsenic in tobacco smoke and the enormous increase in the use of tobacco justify, it is stated, a full investigation of this subject.

#### Centenary of F. W. Bessel (1784-1846)

FRIEDRICH WILHELM BESSEL, the great German astronomer, was born on July 22, 1784, at Minden, about thirty miles east of Hanover. An aptitude for figures and a distaste for Latin led to his apprenticeship in his fifteenth year to a mercantile house in Bremen. Here he acquired a knowledge of English and Spanish, studied geography and navigation, and from these subjects he "groped his way into a new world of astronomy and mathematics". The works of Bode, von Zach and Lalande were his companions, and by their aid he deduced an orbit for Halley's Comet. The result he sent to Olbers, who immediately sent it to von Zach for publication, and thus Bessel's name became known. In 1805, Harding, Schröter's assistant at Lilienthal, was transferred to Göttingen, and Bessel, whose success in business was assured, renounced the prospect of comparative affluence for "poverty and the stars". Five years later he was chosen by the Prussian Government to superintend the erection of the new observatory at Königsberg, on the completion of which he was appointed director. Through his labours this establishment became the chief of German observatories and a centre of improvement for the whole astronomical world. Bessel remained at Königsberg for the rest of his life and died there on March 17, 1846.

Bessel's first great work appeared in 1818 under the title of "Fundamenta Astronomiæ". In this he gave to the world the results of his elaborate investigations of Bradley's observations made at Greenwich during 1750-62. "The eminent value of the work consisted in this, that by providing a mass of entirely reliable information as to the state of the heavens at the epoch 1755, it threw back the beginning of exact astronomy almost half a century" (Clerke). In 1830 Bessel published his "Tabulæ Regiomontanæ", which became the standard work of its kind. He had, in 1821, commenced observations of all stars down to the ninth magnitude comprehended within the parallels of 15° south declination and 45° north declination. In this he was assisted by Argelander. The observations amounted to 75,000 and they were not complete until 1833. He also determined the parallax of  $\gamma$  Cygni, he made many observations and physical inquiries on comets, he investigated the theory of the pendulum, discussed the figure of the earth, and also directed the operations for connecting the Russian triangulation with those of Western Europe. His name is also associated with the Bessel function; this mathematical form, developed by Bessel for research in planetary perturbations (1824), has been widely used in celestial mechanics, wave-theory, elasticity, hydrodynamics and related modern investigations.

#### Giulio Bizzozero (1846-1901)

THOUGH the memory of Bizzozero, the centenary of whose birth falls on March 20, is eponymously honoured in 'Bizzozero's corpuscles', it may be said without undue straining of the phrase that his signature is writ large upon many a page in the annals of