

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 Regiomontanae", 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 γ 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

physiology and pathology. Virchow's ablest pupil, Bizzozero at the age of twenty-seven became professor of general pathology at Turin, where he proved himself an attractive lecturer, lucid both in thought and expression. Among the first to study the histology of experimental tuberculosis and to observe cell inclusions—pioneer work anticipating the conception of phagocytosis—he was an early student of the hæmopoietic function of bone-marrow, and in 1882 named the blood-platelets (first noticed by Donné in 1842 and more fully described by Osler in 1873), recognizing their participation in blood coagulation. His "Manual of Clinical Microscopy" (1885) went through several editions and translations. Forced by choroiditis to abandon microscopic work, Bizzozero enthusiastically plunged into sanitary reform. Tall, delicately built, with fine features, he was a victim of chronic neuralgia, which however failed to ruffle his serenity and to curb his mania for work. He died of pneumonia on April 8, 1901. Among his distinguished disciples, Golgi, Bassini and Foà have found international fame.

Deaths of Czech University Workers during the German Occupation

DR. N. WOOSTER, "Brooklyn", Cherry Hinton Road, Cambridge, was recently in Czechoslovakia, and arranged with Prof. J. Bělehrádek, rector of the University Charles IV, to receive a list of the staff of Czech universities who died as a consequence of the German occupation. Some of those mentioned have already been referred to in the obituary columns of *Nature*; but it is of interest to have the complete list arranged, as Prof. Bělehrádek has done, by universities and faculties.

Caroline University: Faculty of Arts: six deaths. *Faculty of Medicine*: thirteen deaths, including Prof. Hynek Pelc, professor of social medicine (executed); Dr. Vladimír Bergauer, general biology (gassed with his wife at Mauthausen), and Dr. Vladimír Tůma, histology (beaten to death in the Pankrác Prison). *Faculty of Science*: Prof. František Závíška, professor of theoretical physics (died on his way from the concentration camp) (see *Nature*, March 9, p. 292); Prof. Václav Dolejšek, professor of physical chemistry (died in Terezín); Prof. Jan Auerhan, professor of statistics (executed); Prof. František Ulrich, professor of crystallography (mortally wounded while being arrested); Prof. Jaroslav Štokán, professor of zoology (executed); Dr. Radim Nováček, mineralogy (executed).

Czech Technical Institute in Prague: Prof. Viktor Felber, professor of mechanics (executed); Prof. Jaromír Šámal, professor of zoology (executed); Prof. Leopold Šrámek, professor of general electrical technology (executed); Prof. Jindřich Svoboda, professor of spherical astronomy (died as a result of imprisonment); Otakar Runa, assistant lecturer in technical mechanics (executed); Oldřich Mirtes, assistant lecturer in technical mechanics (died in Auschwitz); Karel Kašík, assistant lecturer at the Institute of Hydraulics (executed).

Masaryk University (Brno): Faculty of Law: six deaths. *Faculty of Medicine*: Prof. Karel Horák, professor of anatomy (executed); Prof. Jan Florian, professor of histology and biology (executed) (see *Nature*, March 2, p. 257); Prof. Miroslav Křivý, professor of neurology and psychiatry (died in prison). *Faculty of Science*: Prof. Vojtěch Rosický, professor of mineralogy (executed); Prof. František Koláček, professor of geography (executed); Prof.

Antonín Šimek, professor of physical chemistry (executed); Dr. František Schacherl (died in a concentration camp).

Beneš Technical Institute (Brno): Adolf Zobač (executed); Prof. Josef Sahánek, professor of technical physics (died in a concentration camp); Dr. Vladimír Němec (chemistry); V. Beneš; Dr. Jaroslav Mrkos, assistant lecturer; Dr. Bohuslav Hrdlička; Jaroslav Potoček, assistant lecturer; Prof. Bohumil Kladivo, professor of geodetics (died as a result of persecution); Dr. Bedřich Pospíšil, assistant lecturer (died as a result of persecution).

Veterinary Institute, Brno: Prof. Tomáš Vacek, professor of physiology (executed); Prof. Jan Bečka, professor of chemistry (executed).

Agricultural Institute, Brno: František Wenzel; Blahoslav Cermák, Commissioner for the Scientific Institutes (executed); Prof. August Bayer (died in Mauthausen); Dr. Vladimír Krist, assistant lecturer (died in a concentration camp).

Announcements

SIR ALEXANDER CADOGAN, permanent representative of Great Britain on the Security Council, has been appointed to represent the Government on the Atomic Energy Commission of the United Nations; Sir James Chadwick has accepted the appointment of scientific adviser and alternate representative of the United Kingdom on the Commission.

SIR HENRY DALE, recently president of the Royal Society, Prof. James Gray, professor of zoology in the University of Cambridge, and Prof. D. M. S. Watson, Jodrell professor of zoology and comparative anatomy at University College, London, have been elected to the board of trustees of the British Museum.

THE following appointments have been made at the University College of Wales, Aberystwyth. Mr. E. F. Nash, to be professor of agricultural economics and advisory economist; Mr. E. G. Bowen, lecturer in the Department of Geography and Anthropology, to be Gregynog professor of geography and anthropology.

THE following appointments have been made in the University of Sheffield: Dr. T. E. T. Bond, to be lecturer in botany; Mr. J. D. Weston, to be assistant lecturer in mathematics.

A SYMPOSIUM on "Metrology" is being organised by the Royal Society and will be held in the Society's rooms at Burlington House, London, on March 21, commencing at 2.30 p.m. A number of short papers dealing with the principal units and standards used in scientific measurement will be read by the director and members of staff of the National Physical Laboratory.

A DISCUSSION on "Some Aspects of the Chemistry of Macromolecules", arranged by Prof. H. W. Melville, will be held at the Chemical Society, Burlington House, London, on April 4 at 2.30 p.m. Those taking part will include: Mr. C. W. Bunn, Prof. M. G. Evans, Dr. G. Gee, Prof. M. Polanyi and Dr. H. W. Thompson.

THE Board of Trade states that some two hundred German scientific workers and technicians have volunteered to work in Great Britain for a limited period in an advisory capacity. These men will be employed by the Government, which will lend them to trade associations and research organisations.