

investigated a number of problems in connexion with fuel economy, dust prevention, wind pressures, etc., but the work for which he will be best known was on fatigue, cracking and fracture of various materials. The most important papers on this work were: "Fatigue Stresses with special reference to the Breakage of Rolls" (*Proc. South Wales Inst. of Eng.*, 1930); "Fatigue and Corrosion Fatigue with Special Reference to Service Breakages" (*Proc. Inst. Mech. Eng.*, 1933), for which he was awarded the T. Bernard Hall Prize; "The Relation of Fatigue to Modern Engine Design" (*Trans. N.E. Coast Inst. Eng. and Ship.*, 1935). This last paper was in conjunction with two other engineers and was awarded the M. C. James Gold Medal.

A very large number of other papers and lectures on fatigue and allied problems were given to various engineering and technical societies, both in Great Britain and Germany; his last investigation, undertaken at the request of a Government Department, was on the notch sensitivity of certain materials under cyclic stress.

Prof. Bacon devoted much time to the leading engineering institutions; he took a prominent part in the formation of the South Wales branch of the Institution of Mechanical Engineers, was its secretary

for several years and became its chairman. He was also a past president of the South Wales Institute of Engineers and served on the committees of the local sections of the Institutions of Civil and Electrical Engineers.

Although of a naturally reserved disposition, those who knew him best will remember his charm of manner as well as the unstinting interest he took in his students.

We regret to announce the following deaths:

Prof. Frederick Barry, professor of the history of science in Columbia University, aged sixty-seven.

Prof. A. D. Bevan, professor of surgery in the University of Chicago, on June 10, aged eighty-two.

Mr. P. J. Haler, M.B.E., principal of the South-East Essex Technical College, on September 13, aged sixty-seven.

Prof. R. A. von Muttkowski, professor of biology in the University of Detroit, on April 15, aged fifty-six.

Mr. Colin F. Symington, of the Malayan Forestry Service, on September 9.

Mr. C. C. Willoughby, emeritus director of the Peabody Museum of Harvard University, on April 21, aged eighty-five.

NEWS and VIEWS

International Air Transport

A BROADSHEET (No. 208) entitled "International Air Transport", which P E P (Political and Economic Planning) has put forward as a contribution to the widespread discussions now taking place, is concerned with the extent to which the organization of international transport can be entrusted to international bodies. It reaches the main conclusion that there is a strong case for setting up an International Board for Air Navigation and for international public corporations for the operation of certain international services. A start should be made with corporations for Europe and for the North and South Atlantic. It is suggested that out of the large-scale emergency air-services which the United Nations will need to operate in the immediate post-war years to the shattered areas, distributing food and medical supplies, and carrying officials, medical men and technicians, a European airways corporation could naturally grow. Discussing future prospects, the broadsheet considers it certain that air transport will carry more and more international passenger traffic, cost and speed being two of the determinants. Much pre-war ocean travel in the first and cabin classes will be shifted into the air. Air mail is also likely to become more and more important.

The spirit of international co-operation will be essential if the opportunities are to be realized. Co-operation will be essential if air transport is not to continue a creature of nationalism, hampered by lack of freedom of the air and artificially stimulated by subsidies. Co-operation will be necessary to secure common technical standards. Unlimited competition among commercial operators is not likely to be tolerable, pooling agreements to mitigate the waste of competition will be insufficient, and some measure of international co-operation will be essential. This, however, involves reversal of many of the policies pursued in the past. The broadsheet visualizes a system of collective security in which an international

police force plays a part and an international board for air navigation, following the precedent of the International Commission for Air Navigation established under the League of Nations. The possibilities of commercial co-operation have already been demonstrated by the International Air Traffic Association.

Reconstruction of the Social Order

IN a memorandum on the reconstruction of the social order, entitled "Peace and the Threefold Commonwealth" (London: Rudolf Steiner Publishing Co.; New York: Anthroposophic Press, 1943, 1s.), Mr. T. G. Jones gives an outline of the ideas of Dr. Rudolf Steiner as indicated more particularly in his books "The Threefold Commonwealth", "The Social Future and World Economy". The human social order is a threefold structure consisting of a body economic, the sphere of the State and a spiritual or cultural life. These are at present so entangled that none of them can develop fully on its own proper basis. If each of these parts of the social order is allowed to develop on its own proper ground it will bear rich fruit for the healing of social disease, and co-operation of the three parts to establish a threefold articulated healthy social order will then be possible. For this purpose economic associations for each industry and a Central Economic Council are suggested, and while the main task of Parliament would be to formulate and administer the code of rights, the economic associations would contribute from their surpluses to the economic support of the spiritual or cultural institutions.

The two main proposals in the memorandum are the allocation of a fair share of work between the several industries under the code of rights by determining mutually fair hours of labour, and the determination by the Central Economic Council of the total production of any one kind of goods and services. Each association would receive for its output a price comprising what it required to satisfy that

part of the total needs of consumption for which it was responsible. To achieve this it would be necessary to fix a standard economic value as a unit of money, and each association would sell its product at a price representing the economic value or "organised labour value", a kind of quotient of work done for the elaboration of a natural product and the organization and division of labour by the human spirit. By distributing these values among the manual, clerical and supervising workers belonging to the association, again according to the consumption needs for which the association is responsible, among the lenders of capital and, through the Central Economic Council, among those for whom the workers in the industry could be held communally responsible in proportion to their needs, it is suggested the root causes of conflict between employers and employed would be eradicated. Other suggestions relate to the provision of funds for new or extended economic enterprise and the issue of money so as to ensure that it is a true medium of exchange and no more, and to prevent the money in circulation exceeding the economic values created.

The Kentucky Dam, Power House and Lock

THIS is a project of the Tennessee Valley Authority, and owing to the proximity of the site to the secondary zone of disturbance of the New Madrid earthquake of 1812, all structures forming part of the main dam were proportioned to resist seismic disturbances (*Earthquake Notes*, 14, Nos. 3 and 4; June 1943). The following seismic loadings were adopted: for mass structures of great rigidity an equivalent inertia force equal to 0.05 g. and for less rigid structures an inertia force varying from 0.06 g. to 0.10 g., based upon rational calculations of the dynamic action of the structure. The seismic increase in reservoir pressures was calculated by the Westergaard formula, using an earthquake acceleration of 0.05 g. For the two large retaining walls at the end of the earth embankment at each side of the river, special investigations were undertaken to establish the proper seismic loading. An extensive programme of shaking-table tests was conducted at Leland Stanford University by Prof. L. S. Jacobsen. On the basis of these tests an equivalent inertia force of 0.18 g. was applied to the conventional Coulomb wedge, the point of application being about 0.60 the height above the base. For structures sustaining hydraulic loads, the increase in overturning moment due to seismic effect was only 7 per cent, while the corresponding increase for structures such as retaining walls carrying earth loads was of the order of 35 per cent. Maps recently sent out by the State Geologist of the State of Missouri indicate large anomalies in both gravity and vertical magnetic intensity in Stoddard County, the locality of the great New Madrid earthquake of 1811. Whether there is any significance in the coincidence is not established, but the seismic precautions mentioned above do not appear to lack wisdom.

The Gas Industry in Great Britain

A BROADSHEET entitled "The Gas Industry in War-Time" (No. 210), which has been issued by Political and Economic Planning, brings up to date the report issued by PEP just before the War. It gives a concise factual account of the structure of the industry, including a note on the work of the Gas Research Board, to which gas undertakings repre-

senting 76 per cent of the gas output of Great Britain are now allied. Civil defence measures, man-power, the effect of the War on the distribution of demand, prices, fuel economy, coal supplies, gas quality, coke-oven gas, and trends in regard to coke and by-products are briefly surveyed. In regard to the last, six committees have been set up to investigate specific problems related to the replacement of imported by home-produced fuels, and to the most effective utilization of the latter in war-time, in particular the possibility of increasing the amount of liquid products—tar, creosote, benzene, toluene, etc.—obtained by high-temperature carbonization in gas-works and coke-ovens. Considerable progress has been made in the use of creosote pitch as a boiler and furnace fuel, although its high viscosity involves certain difficulties.

Public Health in Uruguay

IN a recent paper (*Bol. Of. San. Panamericana*, 22, 394; 1943), Dr. J. C. Mussio Fournier, formerly Minister of Public Health in Uruguay, gives the following account of public health in his country during the period 1938-42: (1) extension of preventive services; (2) better distribution of public health appropriations; (3) considerable increase of hospital beds and in hospital construction; (4) intensification of the campaign against tuberculosis. The Health Division, Bureau of Health Examinations and departments of vital statistics, industrial hygiene and school prevention have been very active and the campaign against diphtheria has progressed. The appropriation for the Ministry of Health has increased 32 per cent. The present Government has spent 1,847,500 pesos on tuberculosis treatment, 590,000 for mental patients, 3,170,000 for the Clinical Hospital, 2,774,000 for improvements in Montevideo and 1,675,000 for rural construction. In 1937 Uruguay had only 1,055 beds for tuberculosis, a number far below present needs, as there are about 2,400 deaths annually from this cause in that country. To-day, however, Uruguay leads all Latin-American countries in the number of beds devoted to that disease.

T. K. Sidey Summer-time Award

THE Royal Society of New Zealand invites applications for the T. K. Sidey Summer-time Award, consisting of a bronze medal and prize of £100, given for contributions to human knowledge by original scientific research in any of the following subjects: (1) the study of light, visible and invisible, and other solar radiations in relation to human welfare; (2) the general study of radiations of every kind. Such scientific research shall not be deemed to be limited to research in medical science. Primarily the award is to be made to a New Zealander or for work carried out in New Zealand, but the Council of the Society is at liberty to vary conditions and subject. Applicants for the award may submit either theses specially prepared or copies of published works. Applications should reach the Secretary, Royal Society of New Zealand, Victoria University College, Wellington, New Zealand, not later than January 31, 1944.

Mathematical Tables and Aids to Computation

ON January 1, 1943, there appeared the first number of a new journal, entitled *Mathematical Tables and Aids to Computation*. It is published by the National Research Council (Washington, U.S.A.), and is to appear quarterly. The subscription is three dollars a year. The editor is Prof. R. C. Archibald,