

The first of these broadsheets, No. 317, dealing with government spending, makes it clear that pressure to this end is likely to arise out of the acute problem of adapting the British economy to a big increase in defence expenditure. The broadsheet, it is true, is concerned chiefly with examining the nature of government spending and its effects with the view of determining whether it is true that no reduction in government expenditure can be made without doing more harm than good, or whether, on the contrary, a high rate of government spending is a drag on economic progress and a hindrance to the long-term solution of the foreign trade problem.

The survey indicates some of the consequences of the Government's need for balancing the claims of defence against those of other economic activities and to decide such questions as the rate of house-building or the amount to be spent on hospitals. The Government, it is pointed out, has only a limited control over some parts of the economy. It must accept that increased spending by public authorities will probably be at the expense of the provision of industrial equipment rather than of consumption. The welfare State involves a high level of taxation to cover large spending by public authorities and large monetary transfers. This tends to diminish the traditional incentive to effort and, in the absence of new ones, to check production. This danger may impose limits on what the Government can do with safety.

The most important conclusion reached here by Political and Economic Planning is that, while the dependence of decisions on policy to some extent on personal judgment is admitted, with consequent room for dispute, the area of dispute could be reduced if more facts and figures were available. Planning decisions must be based on a knowledge of the relevant facts, so far as they can be ascertained. It is true that the total effects of a tax, or of taxation as a whole, cannot be assessed with any degree of accuracy; but at present the planning authorities lack knowledge of ascertainable facts. The figures on government spending are not available in the most illuminating form.

A new classification of government spending may be desirable, and PEP argues convincingly that a more illuminating presentation of the facts about government spending would confer economic benefits by leading to a better organization of the economy. Since the official statisticians of the Treasury and the Cabinet Office do not appear to have supplied the Government with all the ascertainable facts about the activity which is most directly under its control, the broadsheet suggests that the official statisticians should share the work with such bodies as the Oxford University Institute of Statistics and the Department of Applied Economics at Cambridge. The lead must come from the Civil Service, since the first step is the remodelling of the system of accounting and recording in the various departments. If the raw material were thus improved, there is little doubt that the Treasury and the Cabinet Office would receive plenty of outside help in the new research which would be made possible.

The second of these broadsheets, No. 318, dealing with government and industry, goes further into the doctrine of public accountability, but mainly from the point of view of the relationship of the Government to industry in the so-called 'mixed economy' which Britain has now come to be. It attempts to trace the shape of that relationship as it was developing from the full control of the War and

its immediate aftermath to a more liberal system. The broadsheet assumes that the place of the Government in that relationship will continue to be larger than in days gone by, whatever political party holds the power. Some of the fundamental questions which have to be faced in the relations of Government to industry are well summarized in the second broadsheet. The first is the fundamental political dilemma of peace-time: Is Government intervention in industry on the present scale necessary? Further, if there is a need, is the present mixed system—'voluntarism', with a background of control—the right one in principle? Does the system as it operates to-day create the best possible psychological atmosphere? What is its effect on costs, to the firm and to the community? Lastly, in the system as it has developed, is the consumer adequately protected?

SCIENTIFIC COUNCIL FOR AFRICA

EARLY in 1951 the Scientific Council for Africa South of the Sahara held its first session in Nairobi under the chairmanship of Dr. P. J. du Toit of South Africa, and was attended by Prof. J. Millot (Madagascar), Dr. F. J. Cambournac (Portugal), Sir Alexander Carr-Saunders (United Kingdom), Dr. B. A. Keen (British East Africa), Dr. A. Mendes Correa (Portugal), Prof. T. Monod (French West Africa), Col. H. W. Mulligan (Nigeria), Dr. B. F. J. Schonland (South Africa), Mr. N. P. Sellick (Southern Rhodesia), Dr. Georges J. Bone (Belgian Congo) and Prof. Trochain (French Equatorial Africa)*.

Being the inaugural meeting, the Council was chiefly concerned with problems of organization and method. It proved possible, however, to devote considerable attention to examination of the fifty-three resolutions on scientific collaboration in Africa adopted at the African Regional Scientific Conference in Johannesburg in 1950. These resolutions were thoroughly sifted, and priorities were allocated to assist the Council and governmental and other authorities concerned in carrying out these recommendations. Among the proposals which the Council decided should be examined in detail as a first priority were the following: the establishment of an Inter-African Regional Bureau on Geology; the achievement of cartographic uniformity in the maps of Africa, and the preparation of special regional maps dealing with such subjects as geology, climatology, vegetation, vector-borne diseases, etc.; the extension of co-ordinated development in the field of hydrology and water conservation; the calling of a specialist meeting on housing and building research; and the co-ordination of scientific library and bibliography services.

It was reported that considerable progress had already been made in carrying out a number of the Johannesburg Conference proposals. Arrangements were made for the appointment of honorary regional consultants and correspondents in Africa representing all the main scientific disciplines.

To avoid duplication and overlapping of functions with those undertaken by other organizations, careful attention was given to the recommendations of the several African scientific conferences which have been held in the past few years on such specialized subjects as trypanosomiasis, rinderpest and soil conservation.

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Arrangements were made for submission to the authorities concerned of suggestions about items to be discussed at the African scientific and technical conferences already planned for the next two or three years; the Council endorsed the view that international technical conferences should not continue to be convened on the scale of the past three or four years. Major technical conferences in a particular field were regarded as fulfilling most valuable functions if held at intervals of five or more years; but during such intervals the necessary consultation and continuity could best be achieved by arranging meetings of small groups of specialists.

In order effectively to initiate the work of the Council, it was decided that the Council's secretariat should be as mobile as possible during the first year of its operation and that, during this period, it should visit the major centres in Africa, spending one or two months at each centre. The secretariat is expected to begin full-time work as from about the middle of this year and will be under the direction of Dr. E. B. Worthington, at present scientific secretary of the East African High Commission.

SEISMOLOGY IN GREAT BRITAIN, 1949-50

THE fifty-fifth annual report of the Seismological Investigations Committee of the British Association for the Advancement of Science has recently been published¹. Continuing the work of Davison, Dr. A. T. J. Dollar has collected together macroseismic and other information into a paper entitled "Catalogue of Scottish Earthquakes, 1916-49"². During this period there was evidence of 120 tectonic earthquakes, including nine principal earthquakes with associated accessory shocks, and five others of secondary or sympathetic origin, but no unequivocal evidence for twin earthquakes. The positions of epicentres indicate nine seismic regions, mainly grouped around the margins of the Grampian Highlands. Of these regions, Glen More, Breadalbane, Ochil Hills and south Argyllshire showed seismic activities noticeably greater than those in the four regions of Clydesdale, Pentland Hills, Lowther Hills and the Shetland Islands. Among seismic centres, Comrie remained outstanding with fifteen earthquakes for the period, followed by Stirling with eleven earthquakes, and Menstrie, Lochgilphead and Lochaber each with six earthquakes. Damage produced by these earthquakes was slight and almost entirely structural, generally involving no more than the dislodgment of tiles, slates or chimney-pots. In one case, the overthrow of a gable-end near Carron Bridge may have been occasioned by earth tremors in Stirling on July 16, 1940. No human injuries appear to have been caused, either directly or indirectly, by any of these disturbances.

The International Seismological Summary continues to be computed by J. S. Hughes and his staff, working at Kew Observatory by courtesy of the director of the Meteorological Office. On November 5, 1938, a very large, shallow-focus earthquake occurred near Hukusima, which was recorded at nearly every seismological observatory in the world and was followed by many after-shocks from nearly the same epicentre. This involved an unprecedented quantity of observational material which it was necessary to

work up, and has caused some delay in publication. At the time of writing, calculations on data from April 1940 are in progress and completed calculations for the last quarter of 1939 are in the Press. During 1950 the gap between the dates of the earthquakes and the distribution of the International Seismological Summary concerning them has been noticeably diminished.

It is pleasing to note the increased interest in experimental seismology in British universities and research establishments, in addition to the routine investigations made by oil companies. The results of Admiralty research on microseisms have appeared in two papers. The first, entitled "A Theory of the Origin of Microseisms", is by M. S. Longuet-Higgins³. It is suggested that microseisms originate from standing waves on the surface of the ocean. The general conditions for fluctuations in the mean pressure over a wide area of the sea surface is that the frequency spectrum should contain groups of waves of the same wave-length travelling in opposite directions. The pressure fluctuations are then of twice the frequency of the corresponding waves and are proportional to the product of the wave amplitudes. Waves of compression in the ocean- and sea-bed should be set up, which may be of sufficient amplitude to be recorded as microseisms. For certain depths of the ocean the displacements will be increased by a factor of the order of 5 owing to resonance. Suitable conditions of wave interference over deep water would be probably greater than the effect of coastal wave reflexion. The second paper, by J. Darbyshire, is on the "Identification of Microseismic Activity with Sea Waves"⁴. In this paper three series of simultaneous wave and microseism records are examined. They give a clear indication that bands of microseismic waves from different sources can be distinguished by submitting seismograph records to frequency analysis. The agreement between the results of analysis and the theoretical expectation from the prevailing meteorological conditions appears to justify the assumption that microseismic waves of different periods travel independently. Under the simple meteorological conditions that have been studied, each band of microseismic activity can be identified with a band of sea waves of twice its period.

At the Imperial College of Science and Technology, London, the elastic properties of rocks at frequencies between 40 and 120 c./s. have been investigated, and also experiments have been made on the propagation of elastic waves, of frequency 500-1,000 c./s. At the Department of Mining, University of Leeds, field experiments using a Leet three-component seismograph have been made on ground amplitudes and frequencies resulting from blasting operations. At the Department of Geodesy and Geophysics, University of Cambridge, experiments have been made on refraction shooting at sea⁵. Dr. P. L. Willmore has also further developed his seismograph and it is about to be produced by Messrs. Hilger and Watts, Ltd., who also produce the new Milne-Shaw instruments.

As already mentioned⁶, Dr. R. Stoneley has discussed the effect of a low-velocity layer below the surface layers of continents, on the amplitudes of surface waves⁷.

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¹ *Adv. of Sci.*, 7, No. 27 (1950).

² *Trans. Geol. Soc. Glasgow*, 21, 283 (1950).

³ *Phil. Trans. Roy. Soc., A*, 243, No. 857 (1950).

⁴ *Proc. Roy. Soc., A*, 202 (1950).

⁵ *Nature*, 165, 193 (1950).

⁶ *Nature*, 166, 1054 (1950).

⁷ *Mon. Not. Roy. Ast. Soc., Geophys. Supp.*, 6, No. 1, 28 (1950).