



SATURDAY, FEBRUARY 10, 1934

No. 3354

Vol. 133

CONTENTS

	PAGE
Co-ordination of State Scientific Services	189
Obtrusive Legislation	192
Position of British Broadcasting	193
British Dyes. By E. F. A.	194
Structure and Development of Man. By T. H. B.	195
Short Reviews	196
Heavy Hydrogen and Heavy Water	197
Ernst Haeckel (1834-1914). By Prof. E. W. MacBride, F.R.S.	198
Prehistoric and Primitive Surgery	200
Artificial Production of a New Kind of Radio-Element. By F. Joliot and I. Curie	201
Obituary : Sir Donald MacAlister, Bart., K.C.B.	202
News and Views	203
Letters to the Editor : Mass Excretion of Oestrogenic Hormone in the Urine of the Stallion.—Prof. Bernhard Zondek	209
A Source of Error in Photometry.—Dr. A. Langseth and Dr. E. Walles	210
Radiative Collisions of Neutrons and Protons.—Dr. H. S. W. Massey and C. B. O. Mohr	211
Remarkable Optical Properties of the Alkali Metals.—Dr. R. de L. Kronig	211
Diffusion of Water in a Zeolite Crystal.—Dr. Arne Tiselius	212
Weiss Constant of Paramagnetic Ions in the S-State.—Akshayananda Bose	213
Photo-Oxidation of Nitrite to Nitrate.—Prof. N. R. Dhar, S. P. Tandon, N. N. Biswas and A. K. Bhattacharya	213
Anisotropy of Spherical Sound Waves.—Prof. S. Y. Skomtao and L. K. Su	214
Crystal Structure of Copper Sulphate.—C. A. Beevers and H. Lipson	215
The so-called Terminal Parenchyma Cells in the Wood of <i>Terminalia tomentosa</i> , W. and A.—K. A. Chowdhury	215
White Cats and Deafness.—Dr. C. C. Little	215
Spawning Date of the Common Frog.—R. Maxwell Savage	216
A Recent Sedimentary Volcanic Tuff.—W. Campbell Smith and George Rayner	216
Quaternary Intermetallic Compounds.—Dr. A. S. Russell	217
Passage of Hydrogen through Steel.—T. N. Morris	217
Interaction of Radio Waves.—Prof. V. A. Bailey and Dr. D. F. Martyn	218
Audibility of Auroras and Low Auroras.—Floyd C. Kelley	218
Research Items	219
Auroras, Electric Echoes, Magnetic Storms. By Sir Joseph Larmor, F.R.S.	221
Anniversary of the Asiatic Society of Bengal	223
Research in the British Post Office	224
University and Educational Intelligence	224
Science News a Century Ago	225
Societies and Academies	226
Forthcoming Events	228
Official Publications Received	228

Co-ordination of State Scientific Services

IN his recent presidential address to the Royal Society, Sir Frederick Gowland Hopkins referred at some length to the Medical Research Council and its relations to the Agricultural Research Council and the Advisory Council of the Department of Scientific and Industrial Research. Stressing the relations which have from their inception existed between the three councils and the Royal Society, Sir Frederick suggested that their creation and the definition of their respective duties and relations had brought into being a great national research organisation, to be viewed as a whole and fully worthy of the confidence of the Society and of Great Britain. Although even to-day it is not fully understood by statesmen that endowment of research is among the most profitable of national investments, scientific men are now in real control of scientific policy in Britain even when it deals with enterprises endowed by the State.

This reference to the relations which exist between various research councils and research associations deriving part, at least, of their endowment from the State, is welcome in view of certain charges which have recently been brought against them, arising out of the conduct of investigations which are of general interest not only to industry or to social institutions but also to the defence forces of the realm. Two of the most characteristic features of modern scientific development are, indeed, on one hand the extent to which co-operation between different classes of scientific workers—medical men, physicists, biologists, chemists, engineers and others—is again and again required for the solution of a scientific or industrial problem, and on the other, the extent to which discoveries or advances in one field or industry find direct and ready application in many other quite unrelated sciences or industries.

It is accordingly obvious that the Privy Council, under the ægis of which the work of the Medical Research Council, the Agricultural Research Council and the Department of Scientific and Industrial Research is conducted and secured from the dangers of political vagaries and the inhibitions of departmental interference, should take measures to avoid overlapping of effort and the duplication of any expenditure of national revenue. Careful provision has been made to secure adequate contacts within the triad of councils. A nexus of responsibilities has been

established. The three secretaries, for example, are under obligation to meet together on specific occasions for a general discussion of policy; one member at least of the Medical Council must always be on the Agricultural Council, and there are other means of securing co-operation. In spite of the diversity of researches and enterprises associated with each of these councils, effective co-ordination has been possible to a remarkable extent. The dissolution by the Committee of the Privy Council in 1929 of the three co-ordinating research boards for chemistry, physics and engineering, which were originally established in 1920, is in itself evidence of the success with which research is being co-ordinated.

The realisation of the many-sided interests and applications of particular pieces of scientific research undoubtedly led to the adoption of the policy of appointing special *ad hoc* committees from time to time for the consideration of practical problems. Such committees are sometimes departmental committees, but the particular department which initiates or bears the responsibility for their work may afford little or no indication of the extent of the interest or application of that work, which might in fact have been equally initiated by several other departments or research organisations.

The specific charge has recently been made in "Patriotism Ltd.", a publication of the Union of Democratic Control, that the Department of Scientific and Industrial Research has expended a large sum of money on fundamental war research work and on the reorganisation of the research work of the fighting services, and also that the Medical Research Council is similarly financing scientific preparations for war. A careful scrutiny of the published reports shows that in actual fact the whole of the expenditure of the Department of Scientific and Industrial Research has been in research work the results of which have been and are available for industry. It is similarly true that the Medical Research Council has not since the War period undertaken or financed any researches for purely warlike purposes such as, for example, investigation of the effects of chemical warfare.

In view of what has already been said about the general interest of the results of many scientific investigations, it would be highly unlikely that the results of some of the investigations undertaken from purely industrial or medical motives would not have a great interest for some of the fighting services. Equally, in view of the care which any

sound administration must take to secure that neither Civil votes nor the Defence votes are used to pay for the same work to be done twice over, it would be surprising to find that no work had been undertaken by the Department of Scientific and Industrial Research or the Medical Research Council at the request of one of the defence services.

As a matter of fact, the evidence even of the examples cited in justification of its charges by the publication to which we refer indicates that the converse may equally be true. Reference is made, for example, to problems of visual research, on which the Medical Research Council have published a report on "Colour Vision Requirements in the Royal Navy". The results of these investigations, though of special application to service conditions, have also great interest for the merchant marine, the railways, and in relation to road traffic and to some industrial operations.

This matter of visual research illustrates a further possibility which criticism has to weigh. The Medical Research Council has on occasion availed itself of favourable opportunities afforded by conditions in the defence services for the investigation of problems of interest to the Council. This applies particularly in regard to investigations on the value of psychological tests for the selection of personnel for particular forms of skilled work. Such investigations are, of course, initiated directly for the assistance of industry. The investigations on special aptitudes required in rifle shooting were not undertaken at the instance of the military authorities but of the academic psychologist who did the work, and who saw in rifle shooting an operation combining manual, visual and psychological factors which was particularly suited to his study, and naturally found soldiers the most convenient source of material.

Equally it is unfair to charge the Medical Research Council with financing war research when it borrowed special apparatus and trained personnel from the Chemical Defence Research Department for the investigation of the dust clouds that are associated with particular industrial processes and that are likely to be injurious to the workers. Similarly, the Council has drawn on the special knowledge of acoustical problems acquired by the Services in relation to anti-aircraft defence to assist its work on the physiology of hearing, which is primarily aimed at the alleviation of deafness.

It is impossible to assess fairly the work of the

Medical Research Council in such matters if constant regard is not paid to the obvious fact that there are few branches of medical research in which new knowledge will not advance military as well as civilian science. "Patriotism Ltd." also refers to investigations carried out under the Industrial Health Research Board on the value of psychological tests for accident proneness, in which tests were made on a group of air pilots, naval artificers and dockyard apprentices as well as omnibus drivers. The results of some of these tests have already been published in a report by E. Farmer, E. G. Chambers and F. J. Kirk, on "Tests for Accident Proneness", and they have already been utilised by the National Institute of Industrial Psychology as a basis for a series of practical tests which can be utilised alike for the selection of the best drivers from among a number of applicants, selection of the men most suitable for training as motor drivers, for discovering what is lacking in drivers of poor ability in order to remedy their deficiencies if possible, or for advising those who intend to learn to drive what degree of ability they are likely to develop. The value of such practical tests as a means of reducing road accidents is obvious, and the studies upon which they are based are a direct contribution to the welfare of the community, which justifies the use of any available material for its acquisition.

The criticism which has been levelled at the Medical Research Council and the Department of Scientific and Industrial Research arises fundamentally from that failure to grasp the passing of the essential distinction between combatant and non-combatant which holds up progress in disarmament. If the fundamental lesson of the War years 1914-1918, that under modern conditions war has become industrialised and now involves whole populations and not merely armies, navies or air forces, were widely appreciated, disarmament itself would receive a firmer backing and such criticism as that we have been discussing would never be advanced.

There is, however, one point of significance on which the chapter in "Patriotism Ltd." does well to focus attention. It would be indefensible if results of civil research held available for use by industry were not also made available for the defence services. It would be equally indefensible if work undertaken at the instigation of the fighting services, but not specially paid for by contributions from their vote, were not published and made available for use in industry.

There does not appear to be any reason to suppose that publication encounters any opposition, so far as the researches undertaken under any of the co-ordinating *ad hoc* committees and the like are concerned. The Department of Scientific and Industrial Research, however, has initiated a number of co-operative research associations which are financed partly by the Department and partly by the industries concerned. These associations, being on a voluntary basis, are by no means completely representative of the industries they serve, and a good deal of jealousy is encountered from time to time on the part of firms which are members of such associations as to the results of their investigations being available for non-members. Direct opposition of industrial firms to a policy of publication can in fact place the Department in a delicate situation, and since the work of a number of the associations has a direct bearing on problems confronting the defence forces, it can easily happen that industry itself may be responsible for withholding complete publication of the results of such investigations.

Under modern conditions, therefore, it is essential that the research activities which are partly or wholly endowed by the State should be planned and co-ordinated in relation to the needs of the State as an organic whole and not on sectional lines. Any attempt to discriminate too rigidly between the needs of a particular department of State and industry is likely to involve us in acute difficulties if duplication of effort is not to result. This is, of course, not to deny the essential principle that, for example, such departments of State as the Medical Research Council or the Department of Scientific and Industrial Research, should not directly support researches which are primarily of interest to the fighting services and the expense of which should be borne by their own vote.

Sir Frederick Gowland Hopkins has pointed out that scientific men are now in real control of scientific policy in Great Britain, even when it deals with enterprises endowed by the State. Accordingly, much undoubtedly does depend upon the sincerity and loyalty with which scientific workers discharge their trust. Except with their connivance and responsibility, funds allocated for civil purposes cannot be used for the endowment of researches for the benefit of the fighting services which should properly be a charge on votes for the latter purpose. On their integrity the community must rely for ensuring that the civil vote is used

entirely for civil purposes, whether or not defence purposes are served at the same time.

It has to be remembered that scientific workers in Government service can only enter a protest against policy by leaving the service. A State department could not tolerate criticism or opposition from its own servants, and the responsibility for determining what constitutes honourable conduct in regard to specific duties lies with the profession as a whole. Accordingly, a healthy position and loyalty to the highest ideals are ensured as much by a widespread public spirit on the part of scientific workers generally as by the conscientiousness of individual workers. The existence of such a public spirit would not only afford full professional support to those members in actual Government service in the unlikely event of need, but also would induce scientific workers to take an active part in educating public opinion as to the true functions of research in the modern State.

Obtrusive Legislation

THOSE who have reason to know that infertile has an economic value, and that deliberate family limitation has been a factor of some importance contributing to their own social elevation, and wish to share with others the information and the practices which have been helpful to themselves, who hold the view that sex is not to be justified solely because of its relation to reproduction, and who think that parentage should be deliberate and voluntary and not casual and accidental, must necessarily wish to examine with the utmost care any proposed legislative measure which deals with the subject of contraception.

At the present time, a Bill, presented by the Lord Dawson of Penn, and entitled "An Act to Restrict the Sale, Display and Advertisement of Contraceptives", is before the House of Lords and comes up for its second reading almost immediately. A superficial examination of this Bill would yield the conclusion that no serious objection could be taken to its terms. Its purpose is to make it illegal (1) to sell or offer for sale in any street or public place, or by means of an automatic machine so placed that it can be used by persons in any street or public place, any contraceptive; (2) to go to the premises of any person and there sell or offer for sale any contraceptive, unless the sale or offer is made in pursuance of a previous request of that person, or the premises are used

by a dealer in contraceptives who buys to sell again; (3) to display in or outside any shop so as to be visible to persons outside the shop any contraceptive, or any picture or written description of any contraceptive; (4) to send or deliver, or cause to be sent or delivered, to any unmarried person who has not attained the age of eighteen years any circular or other document containing information of any kind whatsoever relating to any contraceptive.

From the fact that the Bill is sponsored by Lord Dawson, who has long been an advocate of birth control, and several years ago, at the Church Congress at Birmingham, stated publicly that he was in favour of contraception, it may be assumed that the Bill is intended only to shield inexperienced youth from the stimulus of the pornographic; it certainly would make it impossible for such to indulge in sexual intimacy completely freed from its more grievous repercussions. To rid the streets of touts and hawkers, and to force a certain kind of shop to adopt a different form of window-dressing is a truly commendable ambition, and if the sole effect of the Bill could be that those people who should use contraceptives would, in the future, obtain them easily from reliable and responsible sources, no one could cavil at it. No one would, if it were the case that birth control clinics were an integral part of the municipal and State medical services, as they might be. But, can one be sure that the difficulties this Bill creates in the matter of obtaining contraceptives will really affect the incidence of promiscuity? May it not be that its main effect will be an increase in illegitimacy and in venereal disease?

The obtrusive display of contraceptives may be objectionable, but from the point of view of the State it is nothing like so wicked as bringing unwanted children into the world. It may be assumed that in the immediate future, at any rate, the Bill, becoming law, would certainly tend to reduce the purchase of, and therefore the use of, contraceptives, not only by unmarried youths but also by those who, in the interests of themselves and of society, should use them for the limitation of their own families. The very ugliness and the vulgarity of the shop window can possess an educational value, revealing to the ignorant necessitous the fact that contraceptives exist. In the opinion of many, this Bill, in the light of modern scientific thought upon the subject of birth control, must appear to be somewhat reactionary and deplorable; it interferes with the