

NATURE

No. 4137 SATURDAY, FEBRUARY 12, 1949 Vol. 163

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MACMILLAN & CO., LTD.,

ST. MARTIN'S STREET, LONDON, W.C.2.

Telephone Number: Whitehall 8831

Telegrams: Phisus Lesquare London

Advertisements should be addressed to

T. G. Scott & Son, Ltd., Talbot House, 9 Arundel Street, London, W.C.2

Telephone: Temple Bar 1942

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FUNCTIONAL APPROACH TO WESTERN UNION 551

THE announcement on January 29 that the Brussels Treaty Powers had agreed to the formation of a Council of Europe has been described as an event which will go down in history as a milestone of our times. As such it must receive the earnest consideration of all thinking men.

In any such association of nations, the part which scientific workers have to play in the maintenance of peace has frequently been discussed. In November last the Committee on Science and its Social Relations made a report to the International Council of Scientific Unions on an inquiry into this matter, which it had carried out among representative scientific men. The replies showed general agreement that the greatest contribution which men of science can make is to stand firmly for full freedom of thought and expression and movement. This affirmation of the necessity of full intellectual freedom is linked up, moreover, with the recognition of the part which the international scientific unions have to play, as well as the United Nations Educational, Scientific and Cultural Organisation, in pursuit of international understanding and co-operation; and it should be noted that the chairman of the United States delegation to the Beirut Conference of the latter Organisation recorded the emphatic conviction of his delegation that the Organisation could only succeed on the basis of intellectual freedom. The direct contribution of science to the maintenance of peace, it seems, is to be essentially technical, though its indirect influence in other fields may not be negligible. There was little support for the idea that men of science as such could, or should, attempt to court any direct political influence.

Certain aspects of the formation and functioning of Western Union are ably discussed by Miss Barbara Ward in her recent book, "The West at Bay"*. She refers to the Middle East Supply Centre as an example of international planning during the Second World War, remarking that in some of its functions it had to deal with problems closely resembling those facing the association of the nations of Western Europe. Its success in dealing with various technical problems of supply and production then engendered the hope, expressed in these columns (152, 671; 1943; 153, 691; 1944), that it might develop into a very valuable instrument of international co-operation in the Middle East. That hope was frustrated, however, by the withdrawal of the United States at the end of the War.

Yet another instance of successful co-operation in a technical field is cited by Miss Ward to illustrate the feasibility of a Western association. During 1945-47, when it was doing its main work, the United Nations Relief and Rehabilitation Administration included in its formal constitution all the Allies, and its achievements provide convincing evidence of the possibility of running even a system of allocations

* The West at Bay. By Barbara Ward. Pp. 234. (London: Allen and Unwin, 1948.) 12s. 6d. net.

and priorities on an international basis, provided the political goodwill of the participating nations is secured. Administrators whose ability and independence of mind are beyond question are also essential for success; but the possibility of forging an instrument for international planning cannot now be seriously questioned.

What is at issue is, of course, the way in which it should be used and the extent to which it should attempt to plan. On this Miss Ward points out that national and international experience alike suggest that planned control should be confined strictly to the essentials. Even this measure of world government will demand the sense of a great and overriding purpose and of high moral and spiritual qualities.

When, in conclusion, Miss Ward lays such stress upon those ideas of man's unique greatness but equal fallibility, of his fundamental rights and of the necessary limitations they impose on government, of the existence of an order of right and wrong, and good and evil, from which these rights are derived and which transcend man and society, she comes close indeed to the ideas disclosed and emphasized by the Committee on Science and its Social Relations. The conception of freedom which she elucidates is that which has illuminated all the debates of the past three years on the freedom of scientific work and thought in face of the military demands for secrecy. Her analysis, brief as it is, demonstrates convincingly that, however aloof men of science may keep themselves, as such, from political action, they cannot evade the responsibility for sharing in the challenging and formidable task of discovering the spiritual basis of a Western association.

Without such a basis, the prospects of a Western association of nations are slender. That much has been recognized from the start. Whatever the political means which are chosen to rally the forces of Western Europe, the terms in which Mr. Churchill at The Hague last May defined the conditions for which it is necessary to contend cannot be challenged and should commend themselves to all men of science who recognize what is at stake:

"The movement for European unity . . . must be a positive force, deriving its strength from our common sense of spiritual values. It is a dynamic expression of democratic faith based upon moral conceptions and inspired by a sense of mission. In the centre of our movement stands a charter of human rights, guarded by freedom and sustained by law. . . . After all, Europe has only to arise and stand in her own majesty, faithfulness and virtue, to confront all forms of tyranny, ancient or modern, Nazi or Communist, with forces which are unconquerable; and which, if asserted in good time, might never be challenged again."

To reach agreement on the technical questions of a Western association—such matters as defence, customs, transport, heavy industry and the like—will not be easy: to reach agreement on a political union will be a task of years. The prosaic and functional approach based on the Brussels Pact would seem to be the most practical line of development.

It will call for all the help which public and private bodies in every country can give, and the recognition that the movement for Western Union requires such co-operation is an outstanding feature of the Labour Party's recent pamphlet "Feet on the Ground—a Study of Western Union". It is not often that a political party recognizes a mistake and makes amends so handsomely, and that gesture alone should encourage the co-operation from many spheres of life that will be required both to shape the functional instruments and to formulate more clearly in terms of modern life the Western tradition. The Lysenko controversy has brought to the world of science a fresh realization of the danger to the intellectual and spiritual independence which is both an essential element in a creative civilization and a vital part of that Western tradition. Freedom of thought has ever been the secret of all creative epochs and not of scientific advance alone. Scientific workers have their responsibility to rally in support of the maintenance of high standards of truth and taste, now threatened by mass hysteria, both national and class; but they can only fully discharge that responsibility in association with others.

Some of those other contributions were indicated by a meeting held in the Royal Albert Hall last April to demonstrate the support of the Christian community for the idea of Western Union; and on the Anglican side, the report of the Lambeth Conference contained some indications of an attempt to think out afresh the moral and spiritual foundations of Western Europe. The joint congress of the Classical Association and the Hellenic and Roman Societies at Oxford in August also showed that the classics have a place in Western Union and a distinct contribution to make in the formulation of a clearer understanding of the foundations of our Western civilization, with its Greek and Roman as well as Christian elements. That conference, indeed, gave a clue to a way in which the problem of specialization might be solved, and the contribution of the specialists integrated with the need for unity and a common inspiration; it gave an encouraging example of the way in which the professional man, individually and collectively, could help in the renaissance of Western Europe.

That a Charter of Human Rights has now been adopted by the United Nations has no doubt contributed to the achievement of Western Union. It gives concrete expression to one of the affirmations of the preamble to the Brussels Pact, and it should give fresh encouragement to individuals and professional associations to think out and formulate the further measures required both to secure the ultimate objective, and also the widespread understanding of the principles and ideals upon which the effective functioning of a Western association in any form depends. Upon the functioning and co-operation of such groups the preservation of individual freedom and of human rights in general will depend. The contribution of men of science will not be made solely in the technical field. Science itself is one of those cultural activities which has helped to shape the Western tradition. Scientific men in Britain might

render valuable service to the cause of a Western association of nations by developing their international contacts in Europe and America. In this way they can help their American colleagues, with whom they share so much of the tradition and ideals of Western Europe, to understand something of the difficulties which make the early federation of Western Europe impracticable, as against a gradual approach to an integration preserving the diversity on which European civilization partly depends.

The war-time experience which led to the creation of such instruments as the Middle East Supply Centre, the Combined Raw Materials Board, the Combined Production and Resources Board, the Anglo-American Caribbean Commission and the Supreme Headquarters, Allied Expeditionary Force (Shaef) has shown the lines on which a form of functional union might be achieved. To secure the forging of such instruments of European union in time of peace requires more than the threat imposed by a 'cold war'. It requires the sense of common purpose, ideals and traditions of which the Brussels Pact is the embryonic expression. In his book "From the League to U.N.", Prof. Gilbert Murray gave last year an account of the work of the Committee of Intellectual Co-operation which shows how important is the task of creating a strong international culture in the defence of peace and freedom. The task of intellectual co-operation has now passed to the United Nations Educational, Scientific and Cultural Organisation; and the main hope of Western Union and the preservation of the rich heritage of Western civilization may lie not so much in the success of functional co-operation—the crystallization of some sense of common economic and material interests—as in the extent to which that new Organisation, loyally supported and wisely used, is able to make plain, in Gilbert Murray's words, "some sense of values, of obligations, of things of beauty, which are somehow beyond question and which, at whatever cost of endurance, humanity must not betray".

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CHEMOTHERAPY AS A SCIENCE

The Basis of Chemotherapy

By Dr. Thomas S. Work and Dr. Elizabeth Work. Pp. xix+436. (Edinburgh and London: Oliver and Boyd, Ltd., 1948.) 26s. net.

CHEMOTHERAPY was a term used by Ehrlich to denote the treatment with substances of known chemical composition of an infected host, in such a way as to destroy the invading organisms or to neutralize the toxic action of their products. A chemotherapeutic agent must therefore be a substance which has no action against the host, but specifically attacks the infecting organism and either kills it or renders it susceptible to the defence mechanisms of the host. Until recently, new chemotherapeutic agents have been discovered by accident and then subjected to chemical modification in an attempt to improve their effectiveness. The discovery of such drugs has been followed, often after an interval of many years, by elucidation of the

nature of their action. There must, however, come a time when it will be possible to design drugs to inhibit processes peculiar to parasitic organisms and so produce chemotherapeutic agents on a rational basis.

It is doubtful whether there is yet sufficient knowledge of anabolic biochemistry or of the differences between host and parasite to provide such a basis, but Drs. T. S. and E. Work in "The Basis of Chemotherapy" have made a promising attempt to indicate the fundamental lines upon which such a development might be expected to take place. The book begins with a historical account of the development of chemotherapy, and the first half of the book then gives an excellent account of the present knowledge of cellular metabolism. In this section the authors summarize what is known of enzymes and their inhibition, essential metabolites and their relation to growth factors and prosthetic groups, metabolism of carbohydrate, fat and protein, together with outlines of the various oxidation and fermentation cycles involved. Here we have the known metabolism of the bacterial cell; but it should be pointed out, in a book on this subject, that much of this metabolism is common to both host and parasite, and it is very doubtful whether any effective chemotherapeutic agent can interfere in these systems. At present it seems probable that studies on the action of chemotherapeutic drugs will reveal the nature of the underlying essential metabolism rather than *vice versa*.

The discovery of the antagonism between *p*-amino-benzoic acid and sulphanilamide provided the first real indication of a possible mode of chemotherapeutic action, and this subject is examined in detail, together with its extension into the general field of drug antagonism. The authors deal with antagonism of arsenical and heavy-metal drugs and present a critical survey of the possibilities and limitations of the use of metabolite analogues. It is hoped that future editions will include some discussion of the recent reports of antagonism of penicillin and acridines by nucleoprotein and of streptomycin by lipositol, although at the moment such findings merely emphasize the gaps in our knowledge of the underlying metabolism. A point of minor criticism is that the authors several times refer to penicillin as bacteriostatic, whereas much of the later work on this antibiotic indicates that its action is lethal and irreversible.

One of the most interesting aspects of drug action on bacteria concerns acquirement of resistance, and the chapter on this subject forms the most useful and informative in the book. Resistance to penicillin and the sulphonamides is the result of selective growth of resistant mutants; these may arise by production of metabolic pathways alternative to those blocked by the drug, by increased production of the competitive analogue, by production of an enzyme destroying the drug, etc. The authors give an excellent exposition of these aspects and also deal with the possibilities of drug resistance arising other than by mutation as suggested by the work of Hinshelwood and co-workers. Finally, there is an authoritative chapter on the relation between chemical structure and activity. Subjects dealt with here include the variation of activity with structure of surface-active substances, basic dyes and sulphonamides; much otherwise scattered but relevant material on ionization and resonance effects are usefully collected here.