

# NATURE

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## SCIENTIFIC ORGANIZATION OF SOCIAL ACTIVITIES

EXPERIENCE has indicated that some of the economic and social activities of a nation cannot safely be left to unguided individual initiative or interest. Education has long been reckoned as such a social activity, and most of the effort required to supply the essential needs comprised in the idea of the social minimum and embodied in what has been described as a new Bill of Rights for the citizen might be placed in the same category. Mr. Geoffrey Crowther, editor of the *Economist*, in an article in the American periodical *Fortune*, goes so far as to suggest that all activities connected with the supply of the nation's food, including production, as agriculture, and distribution and processing, should be planned and controlled by the nation in order that the new standards of nutrition, etc., may be secured. The magnitude of the problem suggests at once that it is by no means easy to draw a line beyond which the profit motive should not be permitted. It may be conceded, for example, that public health is definitely a matter for purposeful organized effort on behalf of the community and cannot be left to the operation of the profit motive. The implications of such a policy, however, are far-reaching and not all obvious. National health is the product of many factors, and some of them, not the least important, owe their primary stimulus, not necessarily, indeed, to the motive of profit or private gain, but certainly to that element of freedom which Mr. Crowther suggests should in theory be excluded from the social field.

The health of the community does not depend only on the general state of nutrition and the standard of living, including all those environmental factors involved in town and country planning, recreation, the location of industry, industrial welfare and the like, and on the social services, such as the health services themselves, whether preventive or remedial. These activities are clearly those which should be planned and run by the community with no consideration of profit and with the main object of effective service to the needs of the community. The public health depends further on the prosecution of scientific research, not merely into nutrition but also into the prevention and cure of disease, and it is at this point that, as is indicated by Sir Henry Dale's recent presidential address to the Royal Society and the recent announcement of the formation of the Therapeutic Research Corporation, there is a definite need for a mixture of the motives of freedom and service. Sir Henry Dale laid the major stress in his address on the importance of freedom and opportunity rather than organization as providing the conditions for the highest type of research. None the less he recognizes the necessity of organization if discovery is to be put to full use, and his example of the association of science with the State without weakening the freedom of the scientific worker so happily illustrated by the Medical Research Council indicates that balance between order and freedom for which Mr. Crowther pleads. Sir Henry holds that the existing



mechanisms for the support of science by the State, while susceptible of improvement, offer no threat to the freedom of science, nor does the wider use of the organized application of science and scientific method to problems of public welfare, or the more effective access of scientific knowledge to those responsible for government.

The train of thought started by Sir Henry Dale and Mr. Crowther thus raises the very pertinent question as to whether the organization of medical and pharmaceutical research is not a matter for the State acting on behalf of the community, and whether after the War the field of activity of the Medical Research Council should not be extended so as to remove or limit considerably the operation of the profit motive in this field. The subject is one which is ripe for fuller consideration, but it must be remembered that in this field the past experience of Government organization or direction does not warrant undue optimism as to the advantage of a radical change in policy. The related field of industrial health supplies a pertinent example.

A recent report of the Select Committee on National Expenditure commented on the neglect to make full use of the Industrial Health Research Board for the scientific study of questions affecting industrial health and the best use of labour. The Government comment on a specific recommendation regarding investigations on the best length of the working week, while accepting as a basis for action the results of the Board's investigations, and indicating that it is proposed to obtain information as to sections of industry or particular kinds of work into which the Board might make further investigations, does not touch the root of the Select Committee's criticism—the inadequate resources and staff of the Board. On this point the recent report of the British Medical Association's Committee on Industrial Health in Factories is far from reassuring; that it should be possible for such a report to characterize industrial health research as on the whole sporadic and unco-ordinated, reflects neither to the credit of Government or people.

The B.M.A. Committee is clearly right in holding that further effort is required to place industrial health research on an adequate and efficient basis. If we have due regard for the national health, we cannot tolerate a system which fails to provide essential staff for the Industrial Health Research Board, or requires its paid secretary to act also as chief medical officer to the Ministry of Supply, and relies too much on incidental research of the medical inspectorate of factories. In the absence of driving force from the Government, we cannot be content to leave research in this field to the medical departments of individual firms.

Whether a fresh organization should be established for this purpose, as recommended by the B.M.A. Committee, is quite another matter. The logical method would be to develop the national organization which already exists, and extend the work and resources of the Industrial Health Research Board, linking up its work with regional schemes or organizations covering particular industries as required. The contacts already established with individual

firms should provide a starting-point or nucleus for further development, and the co-ordination and application of the knowledge already available is unquestionably a matter for the State.

There will be general agreement with the Committee as to the urgency of the matter, and if preoccupation with other matters is the only legitimate explanation, though no excuse, of the Government's neglect of the many problems in this field of the utmost importance to the nation's health that are awaiting solution, the stimulus must come in the first instance from the professional workers concerned. Not merely the medical practitioner but also others concerned with the problems of industrial health—the manager, the chemical engineer, the plant superintendent, the chemist, the labour manager, individually and through their professional associations, must address themselves to the task of educating both the Government and Parliament, as well as the nation at large, to the importance and urgency of these questions from the point of view of our maximum war effort as well as of the long-term health of the nation.

It is, indeed, on the faithfulness and earnestness with which scientific workers turn to this and like tasks of education that the effectiveness of reconstruction and the wider possibilities of a new order largely depend. Reconstruction and the new order to be established after the War will be conditioned—and limited—by the extent to which public opinion is prepared for the necessary changes and understands what is involved. The contribution of the scientific worker in this task of education is, indeed, far more vital than any contribution he may make in the actual administration of the schemes put into operation. Scientific workers as such have no special claims for administrative responsibilities, though their scientific qualifications should not, as so often happens, debar them from administrative office when they clearly possess, in addition, administrative ability. They do carry, however, a special responsibility for sharing in the task of educating the community to an intelligent understanding of the technical or scientific factors involved in public problems concerning health or in any other field.

The report of the Committee on Industrial Health in Factories, and also the formation of the Medical Planning Commission, show that the British Medical Association has under consideration a number of these urgent problems. Some other professional associations, such as the Royal Institute of British Architects—the Institute of Physics and the Institutions of Civil and of Mechanical Engineers, are also seeking to focus attention on the problems that lie immediately ahead. There are other categories of scientific workers who are far from showing signs of being asleep, even on matters not intimately connected with their own profession. The report on industrial health in factories, for example, contains the rather naïve suggestion that an industrial medical officer should be responsible directly to the managing director of his firm, and its proposals for a central advisory body to guide employers in making appointments may well meet with some criticism from within the profession.



It must, in fact, be admitted that scientific workers and other professional men are not necessarily able to take detached or objective views on matters of public policy that affect their own interests, nor even to apply scientific methods to problems outside the highly specialized field in which they are themselves engaged. No less than other sections of the community, they require educating, at least in outlook, and their professional associations, taken as a whole, are representative of conservative rather than of progressive elements. The responsibility for undertaking the task of education, whether within or without the ranks of the profession, lies the more heavily accordingly on the shoulders of those scientific and professional men who are awake to the needs and implications of the present situation. Whether or not the hopes that have been raised of a new and more bounteous world order are to be realized depends largely on the way in which this task of education is undertaken now. The Conference on Science and World Order held last September, the Conference on Science and the War Effort held in January, and the formation of the Medical Planning Commission of the British Medical Association are welcome signs that the task is already being undertaken.

## MODERN THEORIES OF ORGANIC CHEMISTRY

### Modern Theories of Organic Chemistry

By Dr. H. B. Watson. Second edition. Pp. viii+268. (Oxford: Clarendon Press; London: Oxford University Press, 1941.) 17s. 6d. net.

AT the present time organic chemistry is enjoying one of its recurrent periods of profuse activity: an activity manifest in two main directions. In the first, great and impressive advances are being made in the difficult task of unravelling the molecular structures of complex compounds of profound physiological and biological significance. A second characteristic feature of modern organic chemistry is its growing concern with the mechanism of reactions, and great efforts are being made to reach an understanding and eventual solution of this group of problems. In their elucidation the methods of physical chemistry and of physics find as much, if not more, application than do the classical methods of organic chemistry.

This peaceful penetration of the rich and fertile provinces of organic chemistry by the ideas and experimental methods of physics and physical chemistry has been steady and persistent during the last few decades, while in more recent years the pace has quickened. Both branches of chemistry have gained thereby and abundant material becomes available for an interesting story.

The four years which have elapsed since the

publication of Dr. Watson's well-known volume have witnessed notable developments on the theoretical side of organic chemistry, and concise summaries of these have been woven into the fabric of the new edition now under review. The new edition, however, does more than incorporate new material: large sections have been carefully re-written and reference rendered easier by the more abundant use of sub-headings. Further, the order of treatment of various subjects has been revised, leading to improvements both in classification and logical sequence. Topics formerly omitted or merely mentioned in passing, probably being regarded as in too early a stage of development for a balanced review in the old edition, now take their appropriate place in this admirable survey, which covers a wide field in considerable detail. Despite its detail, it is a most readable book; its perusal is greatly helped by clearness of print and orderly arrangement of formulæ. The opening chapter now includes an extension of the earlier section on quantum mechanical resonance and its application to resonance between different bond structures, mesomerism and the stability of the hydrogen bond.

Chapter 4 includes notes on electron diffraction and molecular magnetism, particularly valuable in view of the important parts which these methods may be destined to play in the elucidation of molecular structure. The discussion of dipole moments, now arranged in a more coherent manner, is included in this chapter and its value enhanced by the inclusion of some of the more recent results brought to light by this line of inquiry. Similarly, the general discussion on the applications of the electronic theory of valency to organic chemistry, now forming Chapter 6, is arranged in better order and includes a description of the most recent experimental results and speculations; the account of mesomeric, electromeric and inductomeric effects, rather involved in the old edition, has been clarified and amplified.

A new chapter on esterification and hydrolysis gives an outline of the development of the current theories of these reactions; while the interesting subject of simple substitution reactions in aliphatic compounds, so exhaustively investigated during the past few years by Ingold, Hughes and their co-workers, deservedly receives full discussion in a further new chapter.

The chapter dealing with reactions in which the primary process involves addition to unsaturated compounds is enlarged and describes modern views on the mechanisms of the Knoevenagel, Perkin, Claisen and aldol reactions.

The increased space, now amounting to three chapters, devoted to stereochemistry is an indication of the greater interest being taken to-day by