

## 50 YEARS OF CURRENT SCIENCE—GLEANINGS

### UTILISATION OF SCIENTIFIC RESEARCH†

**E**VEN a brief study of the history of science is enough to convince anyone that there is usually a large time lag between the announcement of a great discovery and its utilisation by industry and the common man. At least a generation had to pass away before the applications of Faraday's classical researches on electromagnetism or Curies', researches on radium reached the people. Even in the recent instance of penicillin, nearly eight years elapsed between Fleming's initial discovery and the subsequent work of Florey and Chain.

A reasonable time lag in such instances is perhaps understandable, but it is clear that in most cases it could be made considerably shorter. In fact, it was emphasised during the British Commonwealth Scientific Official Conference in 1946 that research itself may be in vain unless definite steps were taken by scientists to see that the results of scientific work of potential value to humanity do not lie unused in technical papers and government archives. Research organisations or associated bodies, it was suggested, must accept the responsibility for the utilisation of their results. As Sir Henry Tizard observed in his presidential address to the British Association in 1948, "It is not the general expansion of research that is of first importance for the restoration of industrial health, and certainly not the expansion of government research remote from the everyday problems of industry; what is of first importance is to apply what is already known".

In this connection, the Report (now published in book form\*) presented to the British Commonwealth Scientific Conference held in Australia in 1952, contains many valuable suggestions and is worth our careful study.

The obstacles to the practical application of the results of research, the Report observes, may range from the 'pure' scientist's conviction that research and publication is an end in itself, through the managerial board's fear of plant obsolescence and heavy capital

expenditure, to the possible non-co-operative attitude of foremen and trade union officials who see a threat to working conditions. At the other end of the scale, there have been cases, particularly in the development of new antibiotics and hormone drugs, where premature publicity has stimulated public demand before a manufacturing process has been perfected, and has even prejudiced complete scientific evaluation of the discovery.

The publication of the results of scientific research, no doubt, constitutes an important stage in scientific research, but in the present context of growing public consciousness, it would be a great gain if the scientific worker realises that there is still much ground to be covered between the publication and its application. As for the economic and psychological factors associated with resistance to change on the part of industry and the laity, these need to be carefully analysed and allowed for. In fact, the Report emphasises that official scientific organisations are unlikely to be successful in this direction unless they enjoy the confidence of those responsible for organised industry, including chambers of commerce and the industry on the one hand, and trade unions on the other. The possibilities offered by educational methods of bringing home to the industrialists and others of employing more scientists and technologists at all levels should also be fully explored.

It is of interest to consider here to what extent the conventional methods in use at present—such as publication, abstracting services, etc., may be expanded into something more positive and depending to a large degree on personal contacts.

In regard to this issue, the recommendations made by the Special Committee on Information Services are worth quoting: (a) *Publications*: These should be issued, not only as papers for other scientists, but also in forms suitable for various levels within industry, e.g., managing directors, plant engineers or foremen, as appropriate. (b) *Films, Exhibitions*: These may profitably include travelling exhibitions and demonstrations and Open Days at research institutions. (c) *Information Services*: These should aim wherever possible at giving technical as well as scientific information. (d) *Trainee Schemes*: A number of research institutions have found it useful to encourage their staff to take part in the teaching work of technical colleges specializing in the techniques of their industries. Some also arrange to great advantage conferences of managers, industrial engineers and foremen as a means of spreading information on new

\* *Utilisation of Scientific Research*; Report compiled and edited by Vera Connell, in collaboration with the British Commonwealth Scientific Offices (London). (Butterworth's Scientific Publications), 1954, pp. 212, Price 21 sh. In addition to a review of the various methods adopted to make the results of research widely known and more capable of immediate application, the volume also contains a series of appendices on the organisation of Government research institutions throughout Commonwealth and an account of the methods employed to encourage the utilisation of the results of their research.

† Published in *Current Science*, 1954, Vol. 23, p. 245.

techniques of processes. (e) *Use of Consultants*: While in most countries paid consultants are employed by individual firms to advise on improvements, some research institutions have found it useful to provide, particularly for the smaller firms, industrial liaison staffs, whose duty it is to visit these firms and advise on improvements based on the best practice of the industry.

The problems connected with the translation of a piece of research into a form serviceable to humanity are perhaps greater in our country than elsewhere, but we feel that a great beginning has been made in this direction by the establishment of a network of information services at each of the National Laboratories. The institution of the National Research Development Corporation (recently announced by the Government of India), with the primary object of undertaking in the public interest development to the production stage of scientific discoveries made in government research laboratories, universities and elsewhere, is indeed a welcome move in this direction. The Indian Scientific

Documentation Centre established in 1952 with the collaboration of the UNESCO also deserves mention in this connection.

In a brief notice like the present one, it is hardly possible to do any justice to the host of issues raised by the application of the results of research. However, considering the time and energy which go into the working out of a research programme, it would indeed be a pity if the results thereof should remain unused. Men of science have no doubt a responsibility in this matter, but we should be sadly overstating the case if their responsibility can in any way be regarded as greater than that of industry, management and labour. The whole-hearted co-operation by all sections of the community is therefore essential in making the best possible use of scientific research: but to give effect to it requires, in the words of the Report, conviction of its necessity, continuous and close attention to its operation, imaginative but realistic choice of the methods to be used, and persistence in their application.

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## ANNOUNCEMENT

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### FICCI AWARDS

Four outstanding scientists were honoured by the Federation of Indian Chambers of Commerce and Industry (FICCI) for their contributions in the fields of life sciences, physical sciences and technology. The cash awards of Rs. 20,000 each were presented to the scientists at the annual session of FICCI.

Prof. V. Sasisekharan of the Indian Institute of Science, Bangalore was given the award for his work on the structure of the genetically important molecule, DNA. His work on alternating structure of DNA is considered to be of great significance in molecular biology.

Prof. M.M. Sharma of the Department of Chemical Technology of Bombay University was awarded for his contribution to the development of Indian chemical industry. The technology for recovery of

valuable products from byproduct streams, his design methods for heterogenous reaction systems and novel separation technique are a testimony of his ability of blending chemical engineering and technology to the benefit of industry.

Prof. S. C. Bhattacharya, Director, Bose Institute, Calcutta, shared the award with Dr. P. K. Iyengar, Bhabha Atomic Research Centre, Bombay. Prof. Bhattacharya is recognised for his work in different areas of organic chemistry. Dr. Iyengar is known for his work on reaction and nuclear physics. An eminent investigator of neutron spectrometry, Dr. Iyengar brought several innovations in neutron scattering and lattice dynamics and designed the zero energy reactor, Purnima and high voltage technology for accelerators.