

narcosis are impartially set forth. The effects of anaesthesia on the body fluids are discussed, with sufficient information on biochemistry to make the discussion intelligible to those medical men who have forgotten most of what they learned in the earlier parts of their time as students. Chapters are devoted to the physiology of the liver and the kidneys, with an account of the effects of anaesthetics upon them. There is a short account of methods used to estimate the effect of anaesthetics on tissues, and of the fate of anaesthetics in the body.

The book will probably find a market because it provides the information required for one type of examination in a form that is not otherwise available; but it contains a number of errors. For example, the formula on p. 235 for the rate of disappearance of an anaesthetic in the body must surely have been incorrectly copied. The numbering of atoms in the purine ring on p. 278 is not the usual one and does not correspond with chemical names in the text. On p. 289 a unit of pituitrin is defined as the amount required to raise the blood pressure of a dog by 30 per cent. Anyone who knows anything about biological assays is likely to be deeply shocked at this last statement.

There are forty-five pages of reference at the end, arranged according to the chapter, or part of a chapter, in which each work is mentioned. This system is not uncommon, but inconvenient. The reader who wishes to trace a reference must first find out which chapter he is reading by noting the page and referring to the list of contents at the beginning. He must then find the corresponding section of the list of references, and if he opens the book in the middle of one of these sections there is no indication whether he should turn on or back. This list would be easier to use if it contained, on each page, the numbers of the corresponding page of the text.

J. H. GADDUM

RESEARCH IN CANADA

Research in Canada

Planning for the Coming Years. Papers given at the Symposium of the Chemical Institute of Canada, Quebec City, June 1945. Pp. vii + 160. (Sarnia, Ont.: Imperial Oil, Ltd., 1946.)

THE papers in this volume, sponsored by Imperial Oil, Ltd., were presented at the first annual conference of the Chemical Institute of Canada, held at Quebec in June 1945, and although, as might be expected, of uneven merit, afford a conspectus of scientific research in Canada in some respects broader than that given by the annual reports of the National Research Council. Dr. C. J. Mackenzie's contribution, "Government Sponsored Research", goes far beyond the narrower limits which his position as president of that Council might impose, and he discusses the particular problem of the industrial research association in Canada in view of the relatively few large industrial units in Canada. Dr. Mackenzie looks forward to the activities of Government-sponsored laboratories, such as those of the National Research Council, being directed almost exclusively to the more fundamental aspects of applied research; but he indicates that in the meantime the National Research Council will foster industrial research either on a co-operative basis or through agencies of the type of the Mellon Institute. Dr. R. K. Stratford, chief research chemist of Imperial Oil, Ltd., in his

contribution "The Co-ordination of Research in Canada", also discusses the relations between fundamental and applied research, emphasizing the importance of maintaining a reasonable balance between the man-power engaged in industrial research and in fundamental research in the universities; and he suggests the establishment of technical institutes to help co-ordinate and improve the efficiency of technical men engaged in field service or development work, a suggestion which is elaborated in some detail by Prof. P. Rion.

"The Role of the Universities in Research" is discussed more particularly by Prof. L. Thomson, who endorses Dr. Stratford's view as to their primary importance, but emphasizes that they are equally the source of expert personnel required in government and industry. Prof. Thomson goes on to emphasize the factors on which the effectiveness of the universities both for teaching and research depend, and stresses not only adequate financial support but also the provision of conditions of service to attract the best men, as does Mr. G. E. Jackson in a paper on "The Provision of Manpower for Research in Canada". Much in these and in the other papers reiterates points made repeatedly in discussions on scientific and industrial research in Great Britain in recent years and in the Barlow Report on scientific staff.

The most interesting paper is possibly that by Dr. H. G. Fox on "Research and Invention in the Law of Patents", in connexion with which attention may be directed to Mr. C. Hollins' discussion of "Patentable Invention" (*Chemistry and Industry*, 170; 1945). After dismissing as invalid in the light of Canadian experience Mr. Wendell Berge's assertion that patents have been used to stifle new enterprise and to limit capacity and production, he proceeds to review the Canadian patent system in relation to research. The situation, he holds, is not entirely satisfactory, first because of faulty administration, due largely to inadequate staffing and parsimonious grants from the Canadian Government—weaknesses which, incidentally, are obvious even outside Canada to anyone who has had dealings with the Canadian Patent Office—and, second, because of its insistence upon invention as a basis of grant of a patent. Dr. Fox develops at some length the implications of this doctrine, which he regards as inimical to organised research and team-work. He agrees that to provide the judges in patent cases with a panel of scientifically or technically qualified persons, as suggested by the Joint Chemical Committee, would assist; but urges that the only satisfactory solution is reform of the law itself to eliminate the criterion of invention and replace it by that of improvement, providing protection where a contrivance or discovery is new and useful, contributing something to the technique of scientific or industrial life or representing a step forward in art. Dr. Fox's history of the outlook on subject-matter is valuable and interesting; but it should be observed that the decline in patent activity illustrated by the graph on p. 86 and referred to on p. 115 is not peculiar to Canada. A corresponding decline is apparent at least up to 1939 in the major industrial countries, including the United Kingdom and Germany as well as the United States. Two minor corrections should be noted. The reference on p. 117 should be to the Trade Marks, Patent and Designs Federation, Ltd., while on p. 118 "Joint Chemical Society" should read "Joint Chemical Committee".

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