

A Model of Development

Science Policy and Development: The Case of Israel. Edited by E. Tal and Y. Ezrahi. (Israel-Latin American Symposium on Science Policy and Organization of Research, held in Israel, January 1970.) Pp. 353. (National Council for Research and Development: Jerusalem; Gordon and Breach: New York and London, 1972.) n.p.

THIS volume is a collection of twenty-two main papers delivered at the Israel-Latin American symposium in 1970, plus an extract from the discussion. It suffers from some of the usual defects of such a volume, notably the absence of an index and the unevenness of the contributions which range from over-familiar generalities about science policy to important specific evidence of Israeli experience.

Israel commands special attention from all interested in science policy. She provides a model for those starting science-based industries from scratch, and is endowed with a promising new government organization, the National Council for Research and Development, set up after Professor Katchalski's¹ enquiry of 1966-68. But Israel has also managed to look outward, and help the developing states with her knowledge and skills, though recent experiences in Uganda and in Chad may have been discouraging.

Yet Professor Sabine's view of Israel in his keynote speech at the symposium as "an important pilot plant for the developing countries of the world" claims too much. Even allowing for Israel's special difficulties, these other countries do not have the human and educational resources, the important overseas connexions and the sheer abilities that make Israel unique. Professor Sabine himself reveals he is only a "recent" Israeli, coming from the US, and elsewhere Professor Keynan says 80 per cent of the Hebrew University's research budget comes from abroad. Professor Bergmann indeed emphasizes that the characteristic difference between Israel and other countries is that she had a scientific establishment long before she had a political establishment. Dr Arnon says firmly that Israel cannot provide recipes for other countries: "every country must solve its own problems".

Many of the contributions deal with universal problems: government scientific organization; government finance for research and development; the role of scientists in government and management; the evaluation of research; the argument for independent scientific research even in small countries; industrial attitudes to research; the relationships between pure and applied research, between government and industry and between universities and industry. On

this last item, the influence of the Weizmann Institute and its "industrial park" is especially interesting. The role of defence in science policy is, unfortunately, only touched upon; this is clearly a field where a detailed account of Israel's experience would be illuminating.

The most rewarding chapters, for me, are those in the middle, which deal with agriculture and science-based industry. Dr Arnon's two chapters on agriculture are analytical and practical, lively and illuminating. He cites the development of Arab agriculture in Israel as something really relevant to developing countries, for it shows how knowledge of improved technology *per se* and even the availability of improved inputs has no influence whatsoever on traditional agriculture until a whole set of circumstances change. The industrial case studies are also most interesting, while Mr Tolkovsky's paper on private investment in science-based industries stands high for its wisdom and practical experience.

The volume as a whole reflects the vitality of science and industry in Israel. If too little is said of Latin America, we may take it that the participants from those countries were more anxious to listen than to speak. If so, they would have learned much.

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¹ Professor Katchalski is now President of Israel.

Seeing Infrared

Laboratory Methods in Infrared Spectroscopy. Edited by R. G. J. Miller and B. C. Stace. Pp. xxi+375. (Heyden: London and New York, September 1972.) \$18; £6.25.

THIS is the second edition of a well-known book on the experimental techniques associated with infrared spectroscopy. The infrared method is a very powerful one for structural determination and, in suitable instances, for quantitative analysis. In large measure, its power is to be found in its capability for dealing with an extremely wide range of types of samples—from gases to crystalline solids and from fibres to pastes. In many cases points of experimental technique make the vital difference between success and failure in this type of work and, despite a 25-year period of development, considerable progress continues to be made.

The coverage in topics in this second edition is considerably wider than before and, with the exception of the omission of a specific chapter on infrared emission spectroscopy, is really comprehensive. It includes also chapters on Raman spectroscopy and Fourier transform infrared spectroscopy. The same care as before has been shown in choosing

contributors who are highly experienced in the various techniques, and the editors have been skilful in guarding against unnecessary overlap in the different contributions. It is a pity, however, that there is no index.

Without question this is the best as well as the most up-to-date account of infrared experimental techniques for the chemical spectroscopist. It is very highly recommended and deserves a wide sale.

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The Purines

The Purines: Theory and Experiment. Edited by Ernst D. Bergmann and Bernard Pullman. (Proceedings of a symposium held at Jerusalem, April 1971.) Pp. 61. (The Israel Academy of Sciences and Humanities: Jerusalem, November 1972.) (Distributed by Academic: New York and London.) \$29.

Regulation of Purine Biosynthesis. By J. Frank Henderson. Pp. xv+303. (American Chemical Society: Washington DC, 1973.) \$12.95.

THE first of these books presents a remarkable instant picture of the state of knowledge of purine structure and chemistry at the beginning of the 1970s. By their success in drawing together the majority of outstanding workers in this field, and asking them to present a contemporary contribution to the theoretical and experimental aspects of the purines, the organizers of the symposium have captured, and preserved for society in this one volume, a fascinating collection of forty-eight original papers. There was apparently no division into subject areas during the symposium but a subsequent examination reveals four main areas into which the bulk of the papers could be placed: (1) The molecular structure of simple purines, purine adducts, nucleosides and nucleotides; (2) properties of the purines, for example, tautomerism, site of protonation and metal attachment, photochemical reaction; (3) the organic, biochemical, and medicinal chemistry of purines and related compounds; and (4) papers with a predominantly theoretical content, in particular quantum theory and molecular orbital calculation. The application of physical and physicochemical methods for structure determination is essential to current work and the supreme importance in this field of X-ray crystallography was shown by the fact that more than one quarter of the total papers were largely concerned with this technique. In addition several papers referred to i.r., u.v., n.m.r. and fluorescence spectrometry and electrical conductivity, e.s.r., mass spectrometry, and circular dichroism.

Undoubtedly the first of the above subject areas is the one at present un-