

area from the mechanism of electron energy transfer from excited mercury atoms to paraffins, to the theory of non-Newtonian flow. The second largest is the theory of liquids, which ranges from molecular beam studies (as a means of evaluating intermolecular potentials) to the theory of plastic crystals. The sections on molecular quantum mechanics and properties of molecules overlap somewhat, as might be expected. Biological applications also cover a wide area, from protein conformations to the dynamics of life. No less varied are the engineering applications, which include the synthesis of diamond and the theory of detonation.

As will have been observed from what I have said, the volume accurately mirrors the scientist in honour of whose seventieth birthday it was produced. The man-made terms, mathematician, physicist, chemist, biologist, are too narrow to describe Henry Eyring. In browsing through this volume, the reader is brought face to face with a scientist, a man dedicated to enlarging the understanding of the working of nature, using techniques drawn from many disciplines. And this may well prove an inspiration to the young worker who feels that in the past he has been confined within a rigid but arbitrary discipline. Few scientists, whatever their interest, could fail to benefit from recourse to this volume.

ALLAN MACCOLL

## Science and Indian Development

*Science in India: Institution-Building and the Organizational Systems for Research and Development.* By Ward Morehouse. Pp. xvi+144. (Popular Prakashan: Bombay, 1971.) Rs 25.

*Physics in India: Challenges and Opportunities.* (Proceedings of the Conference on Physics, Education and Research, June 1970.) Pp. iv+323. (National Council for Science Education: New Delhi, 1971.) Rs 10; S4; £1.25.

THE recent interest in the social implications (both good and bad) of science and technology has reached its culmination in what may well be the most significant social problem of all—overshadowing such currently fashionable fields as environmental pollution, the arms race and technological unemployment—that is, the possible use of Western techniques in helping to resolve the problem of chronic poverty endemic in well over two-thirds of the world's population. The argument runs as follows: since one of the principal factors influencing the very rapid rise in the

standard of living of the Western "developed" nations has been the effective application of techniques derived from advances in the natural sciences to the productive process, it is necessary for the underdeveloped world to make every effort to foster science so as to achieve the same ends. Couched in such simplistic terms the process seems easy, but in practice the transplantation of what is to a large extent an alien social process, in spite of colonialism, has proved fraught with difficulties and has in some cases helped to exacerbate those symptoms commonly associated with underdevelopment, for example open and disguised unemployment, urban squalor and neglect of the land. Clearly the field is ripe for research.

Ward Morehouse's *Science in India* is a preliminary account arising out of a research programme currently being carried out at the Administrative Staff College, Hyderabad, on the organization of science and technology in India. The book has two principal aims. First, to provide the beginnings of a theoretical framework which will act as a basis for assessing the impact of scientific organizations on Indian development. Second, to provide an empirical account of the organizational structure of Indian science.

Taking the second aim first, Dr Morehouse has given us a valuable summary of the various bodies connected with Indian science, their respective functions, history, modes of finance, links with the socio-economic environment and relationships with the political power structure. For anyone intending to work in this field, his account must be necessary reading, drawing together, as it does, a wide variety of material from disparate sources. The author's attempts to provide a theoretical framework, however, are rather weaker not so much for what is said but for what is omitted. According to Dr Morehouse a scientific "organization" will only be effective in contributing to development once it has become an "institution". How shall we know when it becomes an institution? Well, when it begins to interact meaningfully with the socio-economic environment and evolves a cohesive dynamic of its own. This type of functionalism, besides evincing partial circularity of reasoning, does not seem to hold much promise for the resolution of the many problems which characterize Indian science today. In particular it does not give us criteria for deciding when a scientific "institution" is not helping development. Nor is there more than a cursory attempt made to define what is meant by "development".

These criticisms do not attach so much to the proceedings of a recent conference on physics education in India (*Physics in India: Challenges and*

*Opportunities*). This conference, sponsored by Indian and American governmental and educational institutions at Srinagar, set out to discuss the principal problems connected with physics teaching and research in India and how these might be resolved. The report consists of a series of papers which stress the need for curricular reform in schools and universities, improved laboratory and library facilities, and a more rational use of teaching staff. In addition the need for education to be more broadly based and more intimately related to developmental objectives is emphasized and there are a number of interesting papers on the brain drain and unemployment of graduates, especially that by Parthasarathi. Again this volume is probably of chief interest to the specialist but could usefully be consulted by those concerned with wider aspects of social and economic development.

NORMAN CLARK

## Swansea Survey

*Swansea and Its Region.* Edited by W. G. V. Balchin. Pp. xx+391+58 plates. (Swansea University: Swansea, 1971.) £2.50.

THIS is the traditional volume prepared on the occasion of the annual meeting of the British Association for the Advancement of Science, in this case at Swansea. A similar volume was prepared for the meeting at Cardiff in 1960 and the two together, although a decade apart in time, provide a South Wales survey.

During the past decade the BA handbooks have grown and the present volume is about twice the size of that prepared for the Cardiff meeting. It also has had the advantage of a geographer editor who is experienced in thinking in regional terms. In a review of this length it is impossible to give attention to each of the twenty-five chapters, even if any one person could be competent to assess them individually. It is to the general structure of the volume, therefore, that these comments must be directed although this means that many excellent, individual contributions may appear to be ignored.

In its general make-up the volume suffers from the nature of its origins. Presumably the earliest productions were meant to be simple guide books to the host cities and their environs, but they have evolved into full scale regional surveys. Unfortunately the handbooks fail to throw off the old role as guides and also a commitment to represent most of the sections of the association. The result is that the volume is not a true regional survey but a hybrid product. The contributions to