

prejudice is not simply an intellectual issue: it is also a moral issue, in the sense that only a worthy view of man can compel the action, and induce men and women to accept the sacrifices, which in one way or another will be demanded of the advanced and also of the more backward areas of the world.

Meanwhile, in Great Britain, no political party seems prepared to deal with the problem of education on realistic lines or to court the unpopularity which might be involved thereby. Trades unions seek to resist changes in practice that would eliminate waste. Even in education and social policy there is much that encourages the increase of the less educable or adaptable types, and tends to undermine incentive and slacken the will to work. Even some lines of research seem to be pursued rather as an excuse for delaying action on already known but unpalatable facts. As Sir Charles Darwin has commented, "the policy of paying most attention to the inferior types is the most inefficient way possible of achieving the perfectibility of the human race". When all regard is had to the possibilities of those advances in knowledge which such researches as Sir Harold Hartley suggested might bring, it should be remembered that mankind has already much knowledge which, if used effectively, could go far towards improving the balance between the demands of an increasing population and world resources. Nor will any fresh largesse which science may confer remove the fundamental need for courage and honesty in the use of present knowledge.

DEBYE'S COLLECTED PAPERS

The Collected Papers of Peter J. W. Debye
Pp. xxii+700. (New York: Interscience Publishers, Inc.; London: Interscience Publishers, Ltd., 1954.) 9.50 dollars.

TO celebrate the seventieth birthday of Prof. Peter Debye, this volume containing a selection of his classical papers has appeared. No one during the past forty years has made so many significant contributions to modern physical chemistry as has Prof. Debye: his name will always be associated with such topics as X-ray scattering, the theory of strong electrolytes, dipole moments and, during more recent years, with the scattering of light by colloidal solutions.

In this book his classical papers on these topics are collected together under their respective headings, together with a number of miscellaneous communications, including the important one on the specific heat of solids. While the book is an important one for purposes of reference, it is most valuable in that it gives us a glimpse of the methods of attack adopted by one who, trained as a mathematician, became in turn professor of theoretical then of experimental physics and finally professor of chemistry, in which subject he received the Nobel Prize. Grouping of the papers in subjects in the volume permits us to follow the progress by which the Debye-Scherrer method of X-ray examination of powders was developed and the subsequent excursions into the exploration of liquids and gases. It is interesting to note that Debye gave an independent

theory of the Compton effect, but a little later than Compton himself. The section on electrolytes is introduced by the well-known paper of Debye and Hückel, which classical paper is the basis of the present-day concepts concerning electrolytes. During the Second World War the United States Government was interested in developing the synthetic rubber industry, and Debye became interested in methods of examination of macromolecular solutions. His interest in the scattering of X-rays naturally led him to investigate the applicability of Einstein's theory of light scattering to randomly coiled molecules, and as a result a method not only for the absolute determination of the weight-average molecular weights but also of the spatial extension of the macromolecules in solution was developed, probably the most valuable tool presented to workers in the field of polymers.

The volume has, as preface, a brief account of the life of Debye, and this is followed by brief surveys of the various topics by H. Mark on X-rays and light-scattering, C. P. Smyth on dipole moments and R. M. Fuoss on the papers on electrolytes. Papers originally in the German language have been translated into English. Perhaps this is the most unsatisfactory feature of the volume: Debye's papers both in German and in English are remarkably lucid and clearly written; but the translations do not do the author justice.

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THE SINEWS OF SCIENCE

Mathematics in Action

By Prof. O. G. Sutton. Pp. viii+226. (London: G. Bell and Sons, Ltd., 1954.) 16s. net.

PROF. O. G. SUTTON is to be congratulated on his book "Mathematics in Action". The publisher's simple comment on the jacket that "the book is a straight-forward account of applied mathematics and its influence on modern ideas concerning that nature of the physical universe" is a bald understatement. The story which the author tells illumines the essential features of the scientific method—the search for basic principles hidden within experimental results, and the development of pathways from basic principles to new experiments and speculations.

The writing is simple and elegant, and not without evidence of a dry humour; the author has a flair for simple exposition and has steered a masterly course between the Scylla of over-simplification and the Charybdis of over-elaboration. The book itself is a pleasure to hold and to read; the illustrations have been chosen with care and have been drawn with sympathetic understanding.

In most books on experimental physics one can scarcely see the wood for the trees. Most books on applied mathematics, on the other hand, model themselves on Euclid; after a token genuflection in the direction of experimental physics, they develop their accounts as a series of deductions from a number of stated general principles. Contact with the world of reality is usually lost, at each new topic, after one or two introductory paragraphs. It is these brief paragraphs which Prof. Sutton has moulded, and expanded, into a book of about 225 pages. "Mathematics in Action" should be of considerable value to young mathematicians, physicists and engineers, in the upper forms of secondary schools, and also in technical colleges and universities. It should be an