

Progress in Non-Destructive Testing

Vol. 3. Edited by Dr. E. G. Stanford and J. H. Fearon. Pp. vii+227+15 plates. (London: Heywood and Co., Ltd., 1961.) 55s. net.

THIS volume contains articles on seven topics, three of which are concerned with X-rays. Recent developments in X-ray spectrochemical analysis have been concentrated on finding the most efficient and speedy detectors. The article includes a discussion of the accuracy now obtainable and also a description of the X-ray microanalyser, which will show, by simultaneous display on two oscilloscopes, an optical image of a small area and the distribution of various chosen elements.

X-ray microscopy has developed to the stage where sub-microscopic flaws, inclusions and lattice defects, including dislocations, may be located and identified. The use of the xerographic process, associated with X-rays, can save time compared with the standard radiographic process. The nature and preparation of the semiconductor plates and their response to X-rays are discussed at some length.

The visco-elastic properties of plastics under dynamic loading can be interpreted in terms of storage and loss moduli—the latter giving the “mechanical internal energy loss”. These moduli are functions of frequency and of temperature. Their relationship to molecular structure and their measurement are discussed in an article.

Optical methods can be used for testing flatness, surface layer strains, homogeneity of thickness or refractive index and for revealing atomic lattice defects. While on the other hand magnetic hysteresis methods can give results which correlate with various other properties, such as composition or mechanical strength. The two methods are dealt with in separate chapters.

The use of electromagnetic testing for such purposes as the detection of local defects, cracks, flaws, inclusions, etc., has required a different theoretical approach from that given by Maxwell's equations.

K. J. PASCOE

Astronomical Dictionary in Six Languages

English/Russian/German/French/Italian/Czech. By Josip Kleczek. Pp. 972. (New York and London: Academic Press, Inc.; Prague: Publishing House of the Czechoslovak Academy of Sciences, 1961.) 25 dollars.

THIS volume, the first of its kind, will be of great use for two categories of persons; for trained translators who are not acquainted with astronomical terms and also for astronomers with a slight knowledge of one of these languages. The author and his co-workers are to be congratulated on the completion of this book which has been prepared with great care. On the pages 16–575 the words and terms are given in six languages. They have been subdivided into 34 sections, the first of these being “General”, the last “Astronautics”. Within each section the words have been numbered. The choice of the sections is somewhat arbitrary, but this has no influence on the usefulness of the dictionary.

The last 400 pages of the book consist namely of six parts in which all the words have been arranged alphabetically in each language with references to the section and number in the first part. This makes the book equivalent to thirty bilingual dictionaries. It is a handsome volume, and the paper and printing are excellent.

P. TH. OOSTERHOFF

The Economics of Education

By John Vaizey. Pp. 165. (London: Faber and Faber, Ltd., 1962.) 21s. net.

IN this book Mr. Vaizey follows his survey of *The Costs of Education* with a lively survey of existing economic thought about education. Beginning with a brief review of what leading economists from Adam Smith and David Hume to Marshall have written about education in general, he surveys in successive chapters comments made on specific aspects, such as education as consumption or investment, the returns to education, expenditure on education, the finance of education, the productivity of education, manpower, teachers and their salaries, and the comments of economists on the schools. Two chapters on education in economic growth extend the survey to the under-developed countries, particularly Nigeria and Pakistan, in which he comments on the appalling waste of talent caused in Britain by the desire of successive Governments to keep down taxes, lead him to a very brief concluding chapter on the role of education in a modern economy. The value of this brief but comprehensive survey is enhanced by an excellent select bibliography, which, however, omits Joyce Alexander's *Scientific Manpower*. For its chapter on “Scientific Womenpower” this little book is more relevant to the British context than the American publication entitled *Womenpower* listed by Mr. Vaizey.

R. BRIGHTMAN

Religion, Art, and Science

A Study of the Reflective Activities in Man. By Prof. John Macmurray. (The Forwood Lectures, 1960.) Pp. 78. (Liverpool: Liverpool University Press, 1961.) 12s. 6d. net.

THIS little volume consists of four lectures given before the University of Liverpool in 1960. The titles are: (1) “Science Out of Bounds”; (2) “Contemplation and Communion”; (3) “Religious Reference”; (4) “Christianity for the Future”. The author stresses in particular the part played by action; it is what people do that is important. There is an excellent discussion of self-transcendence (as opposed to ego-centricity) which derives, one suspects, from the writer's study—as far back as 1927—of the relation of this quality to genius. Religion must incorporate both science and art into a universal fellowship.

There are two matters on which comment may be admissible. The first is that dogma seems to be judged a trifle harshly. After all, it means an opinion, which may harden into a tenet or even into an assertion. Science, like other intellectual activities, has its dogmas, and it is difficult to see how religion can get on without at least some of them, if it is to supply mankind's innermost needs.

The other point is that science appears to be taken almost entirely in the Baconian sense of man's conquest of Nature for material ends, including the acquisition of power. (It is true that much of the early history of the Royal Society would support this view.) But it is simply not the case for the highest achievements of pure science, for example, the works of Eddington and Heisenberg, which approximate more to poetry than to anything else, and have nothing in common with technological triumphs.

Nevertheless, these addresses are fascinating, and most timely: scholars will welcome their advent in print.

F. I. G. RAWLINS