PROGRESS IN MATERIALS SCIENCE

Progress in Materials Science

Vol. 9. Edited by Dr. Bruce Chalmers. (Incorporating "Progress in Metal Physics", Volumes 1–8.) Pp. 389. (London and New York: Pergamon Press, 1961.) 120*s*. net; 20 dollars.

THE existing eight volumes of *Progress in Metal Physics* have been substantial factors in the history of post-war metallurgy. The first volume delighted the young scientists of 1950, and caused the older metallurgists to wonder just what this metal physics might be. Subsequent volumes revealed that metal physics looked rather like the old physical metallurgy, but it is a measure of the influence which has been exerted by the series that we no longer hear about older metallurgists. We are all materialists now.

The ninth volume differs from its predecessors in two respects. First, it has acquired a new title *Progress in Materials Science*, and secondly it is available not only in the well-known form of the red-bound hardback but also the individual articles are also available as separate paper-backed off-prints. With regard to the first change it is a comfort to discover that the new materials science looks very much like the old metal physics. The second change is of much greater importance and is to be welcomed in so far as it may enable a person to have his own copy of any article which is of particular interest to him without his being subject to the expense of the whole volume. The collected articles are of course available in the familiar red binding as before. It is not explicitly stated that the individual articles will be available considerably earlier than the bound collection, but this seems to be implied by the publishers' statement that the new procedure will make it possible to publish each article within five months of its receipt by the editor. It would be very wrong to adopt an excessively carping approach to the detail of what is only the first attempt at a completely new and potentially valuable procedure, but it is to be hoped that the emphasis on speed of publication will not blind authors to the fact of their own responsibility for producing properly finished articles and for seeing the article through the press.

It is in the nature of things that some topics lend themselves to a firmer or more rounded treatment than do others, and, indeed, it is a strength of the new procedure that it does allow a tentative or interim treatment of topics which are in a state of very rapid development. The next stage may well be for the publishers to consider what special arrangements can be made to assist the authors of articles covering rapidly developing fields and to prevent such authors being too rapidly overtaken by events.

In the present collection, the article by Prof. Honeycombe on "The Effect of Temperature and Alloying Additions on the Deformation of Metal Crystals" and that by Drs. Kramer and Demer on "Effects of Environment on Mechanical Properties of Metals" are both in the established tradition of critical review writing in which a wide range of fact and theory appears to have been digested at leisure and re-presented with considered judgement. It is to be noted that the scope of the second of these papers is wider than the title would seem to indicate and the general problem of how the surface of a specimen may influence the mechanical response of the material is examined in most helpful detail.

In the article on "The Hydrogen Embrittlement of Metals" Dr. Cotterill has reviewed a vast range of literature and has sought within the literature for clues to the fundamentals of a very complex situation. It is a pity that his article was not more carefully corrected in proof, particularly out of respect for so distinguished investigator and personality as Dr. Dushman.

In considering "The Structure and Properties of Solid Solutions" Drs. Sivertson and Nicholson have elected to consider those aspects of the physical properties of solid solutions which can be discussed without directing too much attention to the more sophisticated recent descriptions of valence electron distribution. It is valuable to have the thermodynamic and phenomenological view of solid solutions presented against a background of the simpler electron theories and to be reminded of the difficulties which present themselves when the situation is not effectively dominated by a single factor.

Dr. Rowland's account of "Nuclear Magnetic Resonance in Metals" differs from the other reviews in that it is devoted to an exposition of the methods and results of a single, highly specialized, technique. The outsider is bound to be greatly impressed by the sense of continued high-intensity development which is communicated by this article and to look forward to the considered reappraisal of the situation which now seems to be required for the non-specialist reader.

H. J. Axon

ADVANCED PHYSICS TEACHING AIDS

Apparatus Drawings Project (30 Drawings)

Text and drawings prepared by Robert G. Marcley. (Sponsored jointly by the American Association of Physics Teachers and the American Institute of Physics under grants from the National Science Foundation.) Reference Manual. Pp. 289. (New York: Plenum Press; London: Crosby Lockwood and Son, Ltd., 1962.) 290*s*.

WHEN the Russians launched the first *Sputnik* and shook the technological world, there were allegations of technical backwardness in the methods of sciench teaching in American schools and universities. One of the consequences of this well-publicized feeling was the extraordinarily thorough work of the Physical Science Study Committee, which after four years of consulting and testing, produced a full course in physics and published in 1960 a 650 page text-book and a separate 100-page laboratory guide (*Physics* and *Laboratory Guide for Physics*, Boston, Mass., D.C. Heath and Company, 1960.) This is of considerable importance to teachers of General Certificate of Education Advanced Level standard, and is still far too little known in Britain.

The *Apparatus Drawings Project* is equally authoritative and even more revolutionary. It sets out to place the proper apparatus for the teaching of physics within the reach of physics departments of colleges and universities, by giving detailed instructions on how to make it. The initial study on behalf of the American Association of Physics Teachers and the American Institute of Physics began in 1956, like the Physical Science Study Committee, supported likewise by a grant from the National Science Foundation. Its end-product—which will obviously be revised and supplemented as time goes on—is a 300-page quarto volume of working drawings and instructions, together with the identical information repeated in the form of detached drawings suitable for use in workshops.

Some of the material has appeared in print before. For example, Robert G. Marcley's versatile mass spectrometer was published in the *American Journal of Physics* in May 1960; but a good piece of teaching equipment comes out of its cupboard year after year and matures like good furniture. Many of the teaching aids described would be expensive to manufacture, and their design must have cost much effort. It is right that the fruits of this effort should now be widely enjoyed.

The thirty designs include complete experiments (*e*/*m* for the proton and the electron, the magnetic field of a circular coil, mean free path), advanced or fundamental demonstration apparatus (nuclear magnetic resonance, acceleration carts and track), models (Bragg diffraction apparatus, kinetic theory demonstration), new techniques (air suspension devices, high-frequency sound experiments), and general equipment (large electromagnet, power supply and amplifier). They originate