

satisfying career which they offer. If science teaching is to find an honourable place among those opportunities and attract young students to such a career, it will largely be in such measure as the student glimpses in his science master the sense of satisfaction in a high vocation, in the service of worthy ideals which are at least as important to a full life as monetary rewards. To deal effectively with the shortage of science teachers demands both long-term and short-term measures. It may well involve fresh thinking about general education and the standards of university entrance—even about the purpose of university education and of secondary education. First and foremost, however, it demands giving honour where honour is due, that is, according to the science teacher the place in the public esteem that the nature and importance of his work demand and treating him accordingly. Of the teacher it demands that he shows himself worthy of that esteem and allows no false ideas of egalitarianism to lead him to forsake the traditions and standards that, as Dr. Bowden reminds us, made the educational standards in our sixth-forms the best in the world.

## WHO'S WHO IN AMERICAN SCIENCE

### American Men of Science

A Biographical Directory. Edited by Jaques Cattell. Ninth edition. Vol. 1: Physical Sciences. Pp. v+2180. (Lancaster, Pa.: Science Press; New York: R. R. Bowker Company, 1955.) 20 dollars.

ONE of the phenomena of the twentieth century has been the enormous expansion in scientific and technological effort throughout the world, and in no country has this been more marked than in the United States. An indication of this expansion can be gauged from the fact that in 1900 the first edition of "American Men of Science" contained four thousand names, the eighth (1944) some fifty thousand, and the ninth, of which this is the first of three volumes, will have an estimated ninety thousand entries. Of course, it can be argued that the sizes of the various editions may not be proportional to the country's scientific effort, since a compiler can be more (or less) selective in preparing a new edition. Nevertheless, a noteworthy feature of "American Men of Science" is that, since its inception, it has been in the hands of but two editors, and these are father and son: J. M. Cattell was the original editor, and the present work is the responsibility of Jaques Cattell. Thus throughout the lifetime of this work the editorial policy is not likely to have suffered any abrupt changes, and it can be fairly deduced that the growth of "American Men of Science" does, in fact, measure the growth of North American science (Canadian workers are included).

A glance at the editor's preface of the present volume reveals some of the difficulties that had to be faced in compiling the new edition. In the planning stage it was estimated that eighty thousand names would need to be entered, and so it was decided to break the work up into three volumes, on the physical sciences (the present volume), biological sciences and social sciences, respectively. In fact, this was an underestimate, for the original calculation of thirty-

five thousand names for Vol. 1 has turned out in practice to be 43,518, and the total is expected to run to more than ninety thousand. Now that the work is split into three parts, a new problem arises as to which volume a borderline scientist belongs; in particular, this problem arises between Vols. 1 and 2, when dealing with biochemists and biophysicists. In each such case the individual concerned was given the choice of which volume he preferred to appear in, and for most of them a "see reference" has been inserted in the other volume. One cannot help feeling that this has led to a great deal of extra work and complication, all of which could have been obviated if the three volumes had simply covered all the names in alphabetical order. From the user's point of view, if one knows nothing about a scientist except his name, he may be in any of the three volumes. The principal advantage seems to be that those who are interested in but one branch of science need only buy one of the volumes; but for a work of reference such as this, it is far more likely that purchasers will want all three.

Of the other changes for this ninth edition, one that immediately strikes the eye is that an offset printing process has been used throughout, and consequently the lines are not of uniform length. This gives a rather untidy appearance; but it does not diminish the value of the content, and there may well have been over-riding technical and/or economic reasons for choosing this method of printing. A less obvious change is that the former practice of allotting asterisks to a select few who are judged to be outstanding in a particular science has been abandoned. This is a change for the good; there must always be some difficulty (and misjudgment, too) when deciding whether or not to include a particular name in the work, but to attempt to classify those already in as 'ordinary' and 'extraordinary' seems to be making an unnecessary and invidious distinction which an editor would be well advised to eschew. A feature of the work that is to be commended is that Christian names are given in full and all but the first letter are bracketed off in those cases where the bearer wishes to be known by an initial. This is particularly suited to American conditions, since in the New World many people prefer to use their Christian names (and often not the first one) in conjunction with their surnames.

In general, this is a work of reference that has a definite place as the "Who's Who" of North American science. As with all such books, it may contain a few names that scarcely deserve the honour, and almost certainly there must be more than a few scientific workers who are not listed but who could with justice be given an entry. Nevertheless, the work has stood the test of time, and this volume is worthy of the tradition established by the previous editions.

## METAPHYSICS RECONSTRUCTED

### The Metaphysics of Logical Positivism

By Gustav Bergmann. Pp. x+341. (London: Longmans, Green and Co., Ltd., 1954.) 42s. net.

THIS book consists of a selection of essays which the author has contributed to various philosophical journals over the course of several years. They have not been re-cast, and perhaps on that account are the more valuable as showing the development of an active mind as it battles with the