to the skill and care with which the experimental measurements of noise must have been made. To obtain reproducible results from such measurements, especially at low frequencies, is something of an achievement.

The designer of nuclear pulse amplifiers will find the book valuable, if he accepts the fact that the problems considered are by no means the only ones he will encounter. The book will also be helpful to nuclear physicists and others who may have to undertake experiments the success or accuracy of which is threatened by the presence of noise or background radiation.

E. H. Cooke-Yarborough

HISTORY OF SCIENCE

A History of the Sciences

Main Currents of Scientific Thought. By Dr. S. F. Mason. Pp. viii+520. (London: Routledge and Kegan Paul, Ltd., 1953.) 28*s*. net.

NO one can to-day lament a deficiency of general histories of science. Dr. Charles Singer's "Short History" and Sir William Dampier's "History" were early efforts in this field, of which new editions are still in demand. Dr. W. P. D. Wightman's "Growth of Scientific Thought" is a more recent endeavour to cover similar ground, and now there is this fresh survey from Dr. S. F. Mason, of Oxford, which extends from the ancient empires to Lysenko. This is longer, and more complete in factual detail (especially for the modern period), than any of its predecessors, and on many points the structure of the book shows, very properly, the influence of important modern investigations. The indebtedness of Hellenistic science to its precursors among the Egyptians and Babylonians, as well as among the pre-Socratic Greeks, is well brought out. China and India form the subject of separate chapters in which their contributions to the West are analysed. These are important accessions to a general history of science; but they are not without corresponding losses, since Islam is dismissed in six and a half pages, and medieval Europe in sixteen. Dr. Mason then devotes about two hundred and ten pages to the period 1500–1800, in which the extent to which the 'mechanical philosophy' permeated scientific thought is rightly emphasized, and slightly less space to the nineteenth and twentieth centuries. The main criticism of this balance of the attention given to the main stages of scientific development concerns the very recent period, for here Dr. Mason might be judged to linger excessively on topics which have been dealt with already in a multitude of publications.

On other points, however, Dr. Mason adopts a more conservative attitude. It is a little surprising to be told that Aristotle's zoological works are of later date than his physical (p. 31); that "medieval craftsmen contributed the experimental criterion to the scientific method" (p. 95); that Boyle "gave the modern definition of a chemical element" (p. 190); and that "When natural philosophy began to show signs of stagnation towards the end of the seventeenth century the nascent science of chemistry suffered a serious reverse" (p. 241). On this last question especially, the complete omission of the fundamental work of Mme. Metzger from the bibliography is surely significant. But generally the author proves himself well acquainted with the present flood of research on the history of science—though he lists few non-English publications.

This has helped him to build up a detailed story, especially from the sixteenth century onwards—that is, about four-fifths of the volume. He has assembled a much greater wealth of information on many subjects (for example, science and religion at the time of the Reformation; embryology; and the cell-theory) than is available in any comparable book. To have done so is probably its highest merit, and it is regrettable that the entire lack of illustration must render some of the material unintelligible to readers to whom such matters are unfamiliar. Illustrations would inevitably have increased a very moderate price; but they are ill spared. History, however, is not simply information; the facts must be interpreted. A single theme runs through Dr. Mason's book—that modern science is the product of the combination of a craft and a philosophic tradition with regard to the study of Nature—and it seems that he regards the former as the more important. Thus, he says, the Michurin school of Soviet biologists, of whom Lysenko is the contemporary leader, arose from the work of a practical plant-breeder, while Mendelian genetics sprang from problems in the theory of biology and is largely an academic subject. This he regards as another example of the "difference in outlook between the craft and the scholarly traditions, which has existed throughout written history". The remark may be true, but scarcely in the sense that Dr. Mason intends. Nevertheless, his theme is an important one, for the instruments and experimentation of science have often depended on the resources of craftsmanship, and, more than this, the practical and pragmatic outlook of the craftsman has reinforced on occasion the analytical mind of the philosopher. Yet it is not enough to suppose that this is the whole of science, or that its history is solely concerned with tracing how the latter has successively given place to the former. It is therefore unfortunate that Dr. Mason has not given a fuller account of the way in which he supposes the 'craft' and 'philosophic' traditions to have interacted to yield science, which is so clearly distinct from either. At least in some instances this seems to lead to doubtful propositions, as when he remarks that "a barber-surgeon . . . might be a skilled sectionist and know intimately the anatomical structure of the human body". For while it may be convenient to his thesis to distinguish between this 'craftsman' and the academic Galenist, it is a mere supposition that the barber-surgeon was the better informed of the two.

It would be possible to point to a number of inaccuracies (John Ray's views on fossils are misrepresented on p. 319, perhaps because the author had not consulted Dr. C. E. Raven's authoritative study of Ray) which are inevitable in a work of this scope, even though it can no longer claim to be pioneering. One might ask more seriously: For whom is this book intended? It is not a monograph for the professional historian, nor is it really suitable for the general reader. If it is intended for the cultural education of scientists, it is open to the charge of taking a narrow, and perhaps not very subtle, view of the origins of their studies. May one mildly express the hope that the time has now arrived when it is no longer necessary for every historian of science to take the whole of it for his province?

A. R. Hall