The solutions to many of the problems are formal, in the sense that they are given in terms of the solution or the eigen values of an untreated integral equation. The author certainly gives a more explicit treatment for several specific cases, and often provides a qualitative appreciation of the results, but it is plain that there is work to be done here. The 'mechanization' of the recommended decision and estimation procedures is touched on only lightly, although, on the other hand, the author claims no more than that he is calculating a "standard of performance against which present systems can be measured", and regarding the optimum systems as guides to design.

The literature references are, perhaps understandably, not always those that a statistician would make. In common with most communications engineers, Dr. Helstrom attributes Cramér's result concerning the spectral representation of a stationary process to Rice, while the Cramér-Rao inequality is credited to Fisher.

These are matters of detail, however, well outweighed by the book's merits, of which the main ones are its clarity, thoroughness and consistent appeal to first principles.   P. WHITTLE

PHOTOGRAMMETRY

Photogrammetry
Basic Principles and General Survey. By Prof. Bertil Hallert. (McGraw-Hill Civil Engineering Series.) Pp. ix + 340. (New York : McGraw-Hill Book Company, Inc. ; London : McGraw-Hill Publishing Co., Ltd., 1960.) 85s. 6d.

THERE are very few text-books on photogrammetry in English which are sufficiently modern, or which attain a sufficiently high standard of presentation to help the student bridge the very wide mathematical and technical gap between the long-established fundamental principles and modern developments of the subject. The present book goes a long way to remedy this deficiency, and it must rank as an extremely important contribution to the teaching of photogrammetry. There is much new and thought-provoking material, especially in the appendices (which comprise nearly one-third of the book) and in Prof. Hallert's choice and treatment of worked examples.

Earlier text-books pay some sort of lip-service to the idea of statistical treatment of photogrammetric measurements, but none has examined the theory of errors with special reference to the nature of these measurements and the most convenient methods of adjusting them. The contributions of Prof. Hallert in this field are well known, and it is not therefore surprising that one of the most important innovations of this text is a lucid "Introduction of Photogrammetric Theory of Errors" and frequent use of statistical checks in the worked examples.

The most important criticism which must be made is that there is no proper treatment of analytical aerial triangulation. Five years ago this might have been dismissed as a peculiarly British practice, developed by the Ordnance Survey for a special task. In recent years, however, the suitability of the method has been recognized in many other countries, not only for topographical mapping but also in the applications of photogrammetry to ballistic and satellite research. In this book the part devoted to aerial triangulation deals only with methods of radial triangulation and bridging with plotting machines. The reader is left with the impression that the stereo-comparator is only used for terrestrial photogrammetry. The importance of the camera réseau as the only really satisfactory method of correcting film distortion is not described, despite Hallert's condemnation of the use of a register glass in aerial cameras.

Another remarkable omission is the absence of any description of the more refined methods of analogue adjustment to a block of any sort of aerial triangulation. Slotted templates are, of course, described in some detail, but there is no mention of either stereo-templates or the 'ITC-Jerie' analogue computer. The last is surely one of the most important developments in the whole field of photogrammetry during the post-war period.   D. H. MALING

A HOOKE BIBLIOGRAPHY

A Bibliography of Dr. Robert Hooke
By Sir Geoffrey Keynes. Pp. xix + 115 + 12 plates. (Oxford : Clarendon Press ; London : Oxford University Press, 1960.) 50s. net.

THE recent tercentenary celebrations of the Royal Society have cast our minds back to the early years when that illustrious fellowship was enriched by the inventive genius of Robert Hooke. As curator of experiments, secretary and editor, Hooke was constantly active on the Society's behalf, and he may well have saved it from early extinction. But his colleagues failed to appreciate his true worth ; he was injured by the enmity of the pre-eminent Newton, and his fame suffered a posthumous eclipse which persisted for two centuries. Only in our own day, and largely through the advocacy of Prof. E. N. da C. Andrade, has Hooke received something approaching proper recognition as a pioneer in many branches of science and as Wren's trusted associate in the immense task of rebuilding London after the Great Fire.

Hooke's few published works, now rare, afford but little idea of the immense range and fertility of his inventive capacity as it is revealed in the records of the Royal Society over many years. Much of this recorded material became generally accessible some twenty-five years ago through the publication of R. T. Gunther's volumes on Hooke in his "Early Science in Oxford". Light was cast from another angle on Hooke's enigmatic personality by the editing of his "Diaries". But the archives of the Society and other repositories preserve many still unpublished manuscripts and letters by or relating to Hooke, the location and contents of which are not generally known to students and which should be taken into account in any final assessment of the man and his age.

A concise, serviceable bibliography of all this material has now been compiled by Sir Geoffrey Keynes in fulfilment of a plan conceived many years ago in discussions with the late Prof. John Fulton of Yale. It opens with a prefatory account of Hooke's career and of the problems facing his bibliographer, passing thence to a discussion of the continuation of Bacon's