the art of photography as applied to metals; a capacity for devising mechanical methods which simplify the process of taking a photograph of a metal section; a knowledge of the principles of scientific design and the ability to apply these principles in the mechanical devices employed; and the use of modern methods of precision manufacture and inspection. This obviously involves team work—the co-operation of user and producer. On the latter rests the responsibility for ensuring that the resulting instrument is sound in construction and design. Sound construction requires the application of the best methods of gauging and inspection of the manufactured components. Intelligent design from the manufacturing point of view tends to reduce to a minimum these costly processes; from the user's point of view it aims at ease in manipulation and efficiency in operation. These are all essential factors in the building of an instrument that is to give entire satisfaction to the user or to find a foremost place in either the home or the foreign market.

Standards of Book Selection in Science and Technology.[1]

By Sir RICHARD GREGORY.

IN these days of minute specialisation in science and technology, and of a multitude of books, both general and specific, the problem of selecting the most worthy and suitable works for a library is so difficult that some librarians give it up in despair, while others are content with a solution of it which satisfies their needs and yet does not conform to any particular postulates or propositions bearing upon the principles of selection. As a matter of fact, there are no definite or accepted standards by which the worth of such books can be accurately measured; but the same comment might reasonably be made of works in any other branch of literature — fiction, art, history — with which libraries are concerned. Of the thousands of works of fiction published, what determines their admission to or exclusion from the shelves of public or other libraries? Chiefly the reputation or authority of the authors. So it must be with books on science and technology. When an author is known to have devoted particular attention to the subject of his book, then the work is obviously one to be given serious consideration. A careful compilation may be just as useful an addition to a library, but it cannot have the same authority and therefore belongs to a different category.

There still remains, however, the practical problem of deciding what books are by original authorities and what by writers without the particular knowledge which gives distinction to a scientific or technical book. What librarians would probably like is a monthly list in which such books were grouped in classes of say *A*, *B*, and *C*, according to their importance, but the difficulties in producing such a list are almost insuperable. Failing this, such a list as the "Technical Book Review Index," issued quarterly by the Technology Department of the Carnegie Library of Pittsburgh, provides a most helpful guide to the selection of books on pure and applied science. The Index is arranged in alphabetical order according to authors' names; and it gives extracts from reviews in scientific, technical, and trade journals expressing the scope and value of the works mentioned. It is not supposed that reviews furnish an infallible index to works of outstanding importance, but they do provide a practicable source of information, and a useful purpose is served by bringing them together, as is done in the "Index" of the Carnegie Library.

The recent "Report on Public Libraries in England and Wales" recognises that good and necessary books declare themselves slowly, and that there is an insufficiency of competent critics to help the librarian in his task. The Public Libraries Committee says in this Report:

> Attempts to provide a guide for book selection for librarians, some fairly good, have from time to time been made, but for various reasons have failed. Possibly the task is too difficult, and consequently the present method of book selection in most libraries is and can be little better than the primitive method of trial. It cannot be expected that librarians or book selection committees, however competent as literary critics, should be qualified judges of all scientific and technical publications, and reliable reviews of these are usually the most difficult to find and the most belated in appearance. Librarians would, we believe, welcome assistance in the choice of books by the issue of authoritative surveys of new publications by a panel of competent judges. It is, however, essential that such surveys should not be too long delayed, and it is not easy to find qualified critics who are able and willing to devote themselves to the prompt evaluation of new books. Such surveys are, however, issued by the American Library Association, and are found helpful by librarians in America.

There is no central organisation in Great Britain which affords the same kind of competent guidance in the selection of books as that given by the American Library Association, Chicago. Each month a tentative list of all books received during the previous month is sent to representative librarians, who vote on books they have personally examined; and these votes, together with references to notices of the books in leading journals and opinions from a panel of voluntary workers, are considered by a staff which reads the selected books and prepares notes upon them for subscribers to the list. In the case of new editions (especially of scientific and technical books) libraries are advised whether the alterations are sufficient to make it desirable that the older editions should be replaced by the new.

Here, then, is a system which at any rate provides a sieve by which the more substantial works

[1] Paper read at the fourth conference of the Association of Special Libraries and Information Bureaux at Cambridge on Sept. 25.

are separated from those which pass through the mesh. The Public Libraries Committee suggests that the Carnegie United Kingdom Trust, which has done so much for library work and organisation, might very appropriately promote the establishment of a similar scheme in Great Britain; and we are sure that librarians would welcome such an experiment. Another plan would be to make the Science Library at South Kensington responsible for the selection of scientific and technical books of outstanding importance. The Public Libraries Committee contemplates that this library will be the principal source on which the Central Library will depend for the supply of books needed by research students in science, and the facilities it possesses or could acquire for selecting the best works on science and technology might readily be made available to libraries generally.

The task of deciding what are the best books in any subject is, however, one which no individual or institution can lightly undertake. Lists alone are not sufficient, and if they are annotated then great responsibility is placed upon the judges unless the comments are purely explanatory. There must be different standards for different types of book, and no single touchstone will be sufficient to separate the gold from the baser metal in all the classes. For our present purpose we may distinguish three groups, namely (1) popular works, (2) text-books, (3) works of reference, to each of which a different standard of selection must be applied.

(1) *Popular Science.*—Popular books on scientific and technological subjects vary from childishly simple essays to closely reasoned accounts of the most recent additions to knowledge. They may, however, be divided into two main classes distinguished both by authorship and style. One class consists of books by writers who have the literary art of attractive presentation of scientific fact or conception. They are able to state the case for atoms and electrons just as clearly as for cells and chromosomes. They are not expert witnesses but counsel having the faculty of seeing essential points and expounding them to the court. Every librarian knows the names of some authors of this type who are popular with their readers. The works are often superficial, and scientific critics may regard the treatment as unsatisfactory, yet they serve a purpose in leading readers into realms of knowledge previously unknown to them.

Between this type of popular book with its everyday vocabulary and sentimental appeal and the book by an exponent who knows his subject by first-hand experience there is usually a great gap. Few original investigators in scientific fields are capable also of presenting them in attractive and intelligible language. They use technical words and terms which convey no clear meaning to general readers, and their books are for study rather than for reading as recreation. It is impossible to set a definite standard of suitability for books of this kind or for those of the more elementary type. All that can be done is to be guided by experience as to authors whose works are most popular with particular groups of readers.

A list of one hundred "Popular Books in Science" is issued by the American Library Association. This list was prepared by a special committee of the Washington Academy of Sciences; and it gives, in addition to full bibliographic particulars, a descriptive paragraph about each book and notes upon the various groups of scientific subjects under which the books are classified. The list, though a very useful guide to sound popular works in science, is not altogether satisfactory from our point of view. It certainly includes about forty English books which are available from publishers in the United States; but there are, of course, many popular scientific books which have never been taken over in this way, and these seem to have been left out of consideration.

The principles followed by the Committee in compiling the list are, however, of general application, and are stated as follows:

> Would the average reader who uses a public library, after reading the book in question, read it through to the end and come back to the librarian for another on the same subject? Such a book should be included. Or would he lay it down after a little while and turn to some other kind of book as being more interesting and not return to the subject again? Such a book should not be included, however accurate, thorough, and complete it might be from the standpoint of a specialist.
>
> It is also desirable that the book should not be professedly a text-book, nor should it be written in text-book style; that is, it must not be a book intended primarily for the seeker after information regardless of whether the information be interesting reading or not. It is perhaps needless to add that it should have been written by an author who knows his subject thoroughly and should not be so old as to be obsolete in its facts and speculations.

(2) *Books for Students.*—Text-books for use in school or college belong to a different category from that of popular works for general readers. Their function is not so much to inspire as to instruct, and they sacrifice the flow of language to concise and precise statements of ascertained fact and established principle. The usual standard by which a text-book is measured is that of a proximate or ultimate examination. In Great Britain a school text-book which has no relation to examination requirements has little chance of success however original it may be; indeed, it may suffer by the very originality of its qualities. A list of the best text-books in any subject, therefore, would differ according to the point of view adopted—whether that of original and stimulating treatment or that of preparation for particular examinations. There are few books of the former type and many of the latter. In the text-book field the name of an author does not carry so much weight as it does in more popular literature, and new authors are continually competing with old for first place. Each teacher or professor has his own idea as to what are the best books for his students, so that any list of text-books published by a body

representing the teaching profession tends to become a list of nearly all books available, with no comments on their value.

Two such lists are published, by the Science Masters' Association and the Association of Women Science Teachers respectively. The lists are useful catalogues of titles of class-books and works of reference upon various branches of science, but a librarian or student wishes to know which are the best two or three books in each of the groups, and neither list affords that kind of guidance. In almost any usual school subject of scientific study, there are twenty or more 'best' books, and only individual preference selects one rather than another. It may be doubted whether librarians should include such books on their shelves, or limit themselves to text-books of an advanced type which students may not be able to afford to purchase or which may be of service for reference.

The only sound standard of school-book selection is that of successful experience, and if such books are included in a public library, probably the best plan is to communicate with teachers of science and technology in the secondary and technical schools of the district as to the books in actual use. This may be an unsatisfactory course to follow, but it is preferable to placing upon a librarian the responsibility of selecting the best text-books from scores which are equally serviceable. The tendency in school text-books is towards consideration of everyday things and away from the purely academic attitude, so that some books of this class are as acceptable to many readers as are books written in what is conceived to be a popular style.

(3) *Standard Works.*—An attempt is made to provide a guide to what books are of value to students of science and technology in Sonnenschein's monumental work "The Best Books," the third edition of which appeared a few months ago. Three-quarters of the volume comes under the head of science understood in a broad sense, and there are signs by which works of outstanding importance may be distinguished from others. Such a work, however, soon gets out-of-date, and what librarians want is a periodical list in which scientific works are evaluated on a standard plan.

Almost every week sees the publication of a number of books on various topics of science and technology, and to decide which are of permanent value and which negligible puts too great a strain upon the capacity of a librarian or a library committee. What, for example, determines the works of reference which ought to be in a library and those which may be omitted? Every department of science and technology is now minutely specialised, and for most of the many aspects of them there are special books. Probably the chief means by which the worth of these is measured are reviews in leading journals devoted to science and technology, but such notices are often long delayed; and even the best reviewers have different standards of value. When, however, a work is actually purchased for the library of a leading scientific or technical society, or accepted from one of its fellows, this fact provides positive evidence of its substantial quality. If, therefore, arrangements could be made to compile a monthly list of such purchases, librarians would be provided with titles of works of outstanding importance from which to select what would be most suitable for their reference shelves.

Science and Industry in Australia.

THE Council for Scientific and Industrial Research of the Commonwealth of Australia has decided to issue a quarterly journal which will provide a means for disseminating general information respecting Australian scientific problems and the scientific research work in progress throughout the Commonwealth. In a foreward to the first number of the new *Journal of the Council for Scientific and Industrial Research*[1] (August 1927), the Prime Minister (the Right Hon. S. M. Bruce) stresses the importance of making the best possible use of the relatively small personnel which is available for the scientific investigation of Australian problems. To this end, a Trust Fund of £250,000 has been created for the use of the Council during the first few years of its existence, while the interest on a further sum of £100,000 will be applied to the training of research students, particularly in the biological sciences. On the manufacturing side, the co-operation of the Council with the British Department of Scientific and Industrial Research will be facilitated by the recent visit of Sir Frank Heath to Australia (NATURE, 117, 460, 697; 1926), and it is hoped that co-operation in agricultural activities will be considered at the Imperial Agricultural Research Conference being held in London this month.

Sir George Pearce contributes an informative article dealing with the organisation and work of the Council, in which he summarises the progress of investigations on plant problems, irrigation settlement problems, entomological problems, animal pests and diseases, stock nutrition, forest products, the preservation and transport of foodstuffs, fuel problems, etc. In addition to this general treatment, special articles are included on "The Commonwealth and Agricultural Research" (Prof. A. E. V. Richardson), "Animal Nutrition Problems" (Prof. T. B. Robertson), and "The Biological Control of Prickly Pear" (A. P. Dodd). There are also reports on co-operative research in the wool industry, and on the Australian meat industry (freezing of beef), together with notes on the investigation and eradication of poisonous plants, astronomical work in Australia, the Australian Radio Research Board, and other matters.

The enormous losses occasioned by imported plant and animal pests have shown the need of

[1] Edited by G. Lightfoot, and published by the Government Printer, Melbourne, at 5s. per annum, post free.