titles. The text of the third Section is an extract from the address delivered by Professor G. H. Darwin (February 9, 1909) in presenting to Poincaré the gold medal of the Royal Astronomical Society of London. It is a brief review of his contributions to analytic and celestial mechanics. This is followed by a list of 85 titles of his publications in this field. The fourth Section opens with another extract from the report of M. Rados relating to Poincaré's contributions to mathematical physics. The list of his writings in this domain comprises 78 titles. The text of the fifth Section is a review by M. Emile Faguet of Poincaré's most recent book on the philosophy of science entitled "Science et Méthode." His writings in this field comprise 51 titles. His book "Science and Hypothesis" has been translated into five foreign languages. The Section devoted to necrology simply gives a list of 17 addresses and notices by Poincaré, on the life and work of Laguerre, Halphen, Tisserand, Weierstrass, Cornu, Berthelot, Kelvin, etc. The last section gives a list of 51 titles on miscellaneous subjects.

Aside from the inspiration to be derived from a reading of the text of this volume, the complete list of Poincaré's writings is valuable for reference. The volume also contains a fine heliogravure portrait of Poincaré.

<div style="text-align: right">J. W. YOUNG.</div>

Des Notations Mathématiques, Énumération, Choix et Usage. Par DÉSIRE ANDRÉ. Paris, Gauthier-Villars, 1909. xviii + 501 pp.

THE present work is practically confined, as regards both subject matter and method of treatment, to the needs of teachers of secondary mathematics. The paucity of historical references and the prolix treatment of many of the subjects tend to detract from its usefulness as a work of reference, and its general method of treatment seems better suited to the wants of those who are interested in seeing self-evident things stated in a clear and attractive form than of those who are seeking abstruse information. The perusal of such a work during periods of relaxation may, however, tend to make matters of secondary importance appear more attractive to the mathematician and thus it may lead to a keener appreciation of the entire mathematical structure.

The number of historical references is not only small but some of those which are given are apt to mislead the reader.

For instance on pages 3 and 177 we are told that the Arabic number symbols were apparently derived from a set of broken lines or angles, equal in number to the units which the various symbols represent. In the first edition of Ball's Short History of Mathematics, page 147, this hypothesis as regards the origin of these symbols is presented, together with the following statement : " This conjecture is ingenious, but I am not aware of any historical basis for it." In the second edition of this history no reference seems to have been made to this " conjecture," and most of the other reliable histories pass it in silence. On the other hand no other theory as regards the origin of these universal symbols is mentioned in the book under review, and the unguarded reader would naturally infer that the theory here advanced had stronger historic support than any other.

As another instance, illustrating the author's tendency to pursue interesting conjectures rather than to be guided by tame historic facts, we may cite his treatment of the symbol = on page 95. After stating that this symbol is attributed to Recorde, 1557, and after referring to the fact that it might have been selected to represent equality because of the equality of the two parallel line segments, he considers the probability of its having been derived from the ancient astronomical sign for the equinoxes. As is well known, Recorde stated explicitly that he selected this symbol because " noe 2 thynges can be moare equalle " than two equal and parallel line segments. It seems strange that any one should try to find better reasons for such a choice than those given by the man who made it.

From what has been said it results that the present work is not free from grave faults. On the other hand it has unusual merits. The lengthy discussion of the symbols in common use and the numerous references to details will doubtless lead many readers to observe matters which they formerly passed unnoticed. The book also offers mathematical reading matter which requires no more effort than the ordinary novel, and should be of no less interest to those who are familiar with the notation of elementary mathematics. It is divided into three parts, of nearly equal lengths, under the headings : enumeration, choice, and usage, respectively.

The first part is preceded by a preliminary discourse of fourteen pages, which closes with a statement of the object of the work and a brief description of the different parts. This part is devoted to an enumeration and explanation of the mathe-

matical symbols in actual use and it closes with directions as
regards editorial work. The object is to give an exposition of
the contemporaneous mathematical notation, omitting what is
very seldom used. In the second and third parts a number of
rules are given as regards the choice and the use of the symbols.
Although these rules may appear to the reader as platitudes, yet
their formulation is not without interest. The subject of
mathematical notation is so important that such efforts to give
a clear expression of what ought to be strict rules in the choice
and use of notation deserve serious attention, especially on the
part of the beginner.

The work closes with an unusually complete table of contents
covering eleven pages. The number of the different subjects is
very large. The various chapter headings are as follows :
Nombres entiers, fractions, quantités déterminées, nombres in-
déterminés, signes d'operations, signes de coordination, signes
de fonctions, signes de relations, notations de la géométrie,
signes de la géométrie analytique, mathématiques appliquées,
signes de rédaction, netteté du signe, précision du signe, rappel
des propriétés de l'objet, rappel des rapports entre les objets,
choix des signes généraux, mesure des quantités, objets d'une
seule sorte en nombre déterminé, objets d'une même sorte en
nombre indéterminé, objets de deux sortes, correspondances
entre deux sortes de signes, objets de plus de deux sortes, cas
difficiles, écriture des expressions, expressions mal écrites, struct-
ure des expressions, expressions abrégées ou condensées, notations
particulières, relations, systèmes d'équations, notations initiales
des problèmes, mise en équations, direction des calculs, verifi-
cations.

<div style="text-align: right;">G. A. MILLER.</div>

Applied Mechanics for Engineers. By E. F. HANCOCK. The
　Macmillan Company, 1909. xii + 385 pp.

IN writing this text the author has boldly, if not wisely,
taken the viewpoint of the engineer in choosing the material
which he considers essential, as well as in the method of pre-
senting it. He has clearly in mind the fact that in an under-
graduate course in mechanics for technical schools the greatest
difficulty encountered by the student lies in seeing the applica-
tion of theory to practice. As stated in the preface, no new
material in the matter of principles and theory is presented.
However, in the matter of application of the fundamental prin-