ful. For it reduces the work to a questionable revision, not of Weierstrass and Kowalewsky, but of Cauchy, as the author confesses in his preface ; certainly in fact as well as in principle not a modern tendency. In fact the author's only plea for a very complicated piece of reasoning, which might indeed have been put into far simpler form, is that "it gives results even for certain singular points, and fails only for the points which we have called *wholly singular* "— for several reasons a doubtful advantage, especially in view of the unfinished state of the work.

In conclusion, the material of the book would seem to be more fitted for a thesis ; or for publication in a journal (in which case nearly twenty pages of repetition and unnecessary examples might profitably have been omitted); or for preservation unpublished, awaiting some of the proofs of convergence of which the author is happily sanguine. In its present form it may serve, if at all, perhaps to some student who will furnish the major portion of the whole by giving these convergence proofs. It is not in any sense a text-book or a treatise, and it is certainly not a book for general purchase.

E. R. HEDRICK.

*The Measurement of General Exchange Value.* BY CORREA MOYLAN WALSH. New York, The Macmillan Company, 1901. 8vo., xiv + 580 pp. $3.00.

THIS is the most exhaustive work ever brought out on the theory of index numbers, embodies a vast deal of labor and acute logic, and will be a mine of information to future investigators. In so well worked ground there is necessarily much that is familiar to students of the subject, though hitherto inaccessible outside the largest libraries. But this editorial portion of the material — the most excellent bibliography, the index, the symbolized summaries of the methods of his predecessors — may prove to be the most valuable part of Mr. Walsh's work.

It is not in place in this BULLETIN to enter on the purely economic aspect of the subject, which is covered by an extended notice by Professor F. Y. Edgeworth in the *British Economic Journal* for September, 1901. But the mathematician and the practical statistician may find themselves puzzled by the confident rejection of the aid of the calculus of probabilities, elsewhere found so helpful both to theory and practice in dealing with complex problems of mensuration. Doubtless—as Professor

Edgeworth points out—the variations between two given series of index numbers according to different systems are within the range of probable error, and therefore inconclusive. What an amount of controversy might have been saved by general recognition of this fact.

To those interested in the theory of averages mention may be made of the appendices, in which are detailed the elementary propositions relating to the arithmetic, geometric and harmonic means, with single and multiple weighting.

The logical method of the work is admirable, its index most complete, but it leaves the reader with the impression that further work must be done and that no one solution will cover what is really a considerable number of independent problems.

J. M. GAINES.

# NOTES.

THE closing (October) number of volume 3 of the *Transactions* of the AMERICAN MATHEMATICAL SOCIETY contains the following papers : " On the groups of order $p^m$ which contain operators of order $p^{m-2}$," by G. A. MILLER ; " On the circuits of plane curves," by C. A. SCOTT ; " Note on the real inflexions of plane curves," by C. A. SCOTT ; " La théorie des plaques élastiques planes," by J. HADAMARD ; " Covariants of systems of linear differential equations and applications to the theory of ruled surfaces," by E. J. WILCZYNSKI ; " On the rank, order and class of algebraic minimum curves," by A. S. GALE ; " On superosculating quadric surfaces," by H. MASCHKE ; " Algebraic transformations of a complex variable realized by linkages," by A. EMCH ; " On the determination of the distance between two points in space of $m$ dimensions," by H. F. BLICHFELDT ; " A definition of abstract groups," by E. H. MOORE ; notes and errata : volumes 1, 2, 3.

THE October number (volume 24, number 4) of the *American Journal of Mathematics* contains : " On systems of linear differential equations of the first order," by M. BÔCHER ; " On the quaternary linear homogeneous group and the ternary linear fractional group," by T. M. PUTNAM ; " On cardinal numbers," by A. N. WHITEHEAD ; " On a method of constructing all the groups of order $p^m$," by G. A. MILLER ; " Non-euclidean