group' and remark that 'abelian group' is used in an entirely different sense in linear group theory. In § 38, on abstract groups, it is stated that 'these generating elements define the group completely,' whereas the generating elements with a complete set of generational relations are necessary for the definition of the group; also as alternative for 'equations' should be given 'generational relations.' In § 63 add 'itself and.' In § 73, 3 the correspondence should be defined. For $(m-1)$ read $(m, 1)$. In § 74, for $(m-n)$ read (m, n). In §85, the identity group is not, as usual, included in the composition series. In § 239 is quoted incorrectly the reviewer's generalization of Hermite's theorem on the analytic representation of a substitution of degree p^a. The two congruences modulo p^a should be equations in the Galois field of order 1^a. Since the variable z is indeterminate in the field, the only reduction consists in applying the algebraic equation $z^{p^a} = z$ and reducing the coefficients modulo p. In formula 9 of page 84, $p^{3n} - 1$ should read $p^{2n} - 1$.

For so elaborate a piece of work, executed with such thoroughness and success, both the specialist and the beginner in group theory must feel most grateful. In pointing out various errors in the literature, a valuable service has been rendered to the student.

L. E. DICKSON.

Pathologische Pflanzenanatomie. E. KÜSTER. Gustav Fischer, Jena. 1903. 8vo. Pp. iv + 312; 121 figs.

Dr. Küster's investigations upon gall-formations and structures of similar character in the plant has led him to a discussion of the entire subject of pathological anatomy of plants. The text-book resulting from this treatment of the subject takes into consideration the major structures that might be considered as histological or organographical departures from the normal, but does not include degenerations, or the phenomena of decay due to fungi or other causes.

The various abnormalities are classified according to the cytological and topographical features presented by their development, and are embraced under the following general heads: Restitution, Hypoplasie, Metaplasie, Hypertrophie and Hyperplasie. *Restitution* is the term applied to all processes set in activity by the loss of a tissue or an organ, and may include the replacement of the lost members by the development of new ones on adjacent parts of the body, or on the injured surface; the substitution of an organ of a different character arising on the injured surface, or the substitution of an organ of a different character on adjacent portions of the plant. *Hypoplasie* includes all processes resulting from disturbances of any kind in which the number, size or differentiation of the cells does not attain the normal. *Metaplasie* is taken to include all development of the protoplasts by which their structure, composition, form or character of the membrane is different from the normal, and includes all progressive changes of the cell not connected with growth and division. *Hypertrophy* is used in its accepted sense to designate the production of abnormally large cells which may be aggregated in such manner as to result in abnormally large organs. Such enlargements may ensue in meristematic or permanent tissues. *Hyperplasie* is used to designate the abnormal increase in the volume of a tissue resulting from an unusual multiplication of the cells. Such increase in the number of cells may consist in the formation of a surplus number of the ordinary tissues, or by the formation of cells of a different character, such as in galls or calluses.

The two last-named divisions of the subject are of the greatest importance from the standpoint of the practical pathologist, and are given an adequate treatment in the present volume. These sections of the book owe much of their value to the original matter adduced by the author from his own investigation. The concluding section of the book consists in a general consideration of the etiology and morphology and pathological structures, and sets forth some of the more important problems of general pathology.

Dr. Küster's book is invaluable to the student of plant pathology, and has much more to commend it than any of the few reading books on the subject which have been written

in English, or been translated into that language. Its interest is scarcely less for the physiologist and for the botanist concerned with the problems of alterations and adaptations of structure. D. T. MacDougal.

New York Botanical Garden,
Bronx Park.

Lehrbuch der vergleichenden Entwicklungsgeschichte der wirbellosen Thiere. Allgemeiner Theil. Erste und Zweite Auflage. Zweite Lieferung. By E. Korschelt and K. Heider. Jena, Gustav Fisher. 1903.

The second instalment of the general part of Korschelt and Heider's 'Lehrbuch,' which has recently appeared, maintains the high standard of excellence which we have learned to expect from these authors. The instalment includes only the sixth chapter, that dealing with the maturation of the germ cells and with the phenomena of fertilization, but it runs to more than two hundred large octavo pages and contains over eighty figures. These numbers will give some idea of the comprehensiveness with which the subjects named have been treated, especially if it be remembered that not a little collateral material was considered in the first instalment of the work and is, therefore, omitted or merely referred to in the present part.

When all is of such general excellence it may seem invidious to make special mention of certain of the sections. In section IV., however, there is presented an admirable statement and discussion of the maturation divisions in their relation to the reduction question, and in its presentation certain new terms are introduced to indicate the three methods of maturation division recognized by Häcker. To the method, observed by Boveri in *Ascaris,* in which both the divisions of the chromosomes are longitudinal and in which, accordingly, there is no reduction division in the Weismannian sense, the term *eumitotic* is applied, since it is the method characteristic of ordinary somatic mitoses. For that method in which one of the chromosome divisions is transverse and the other longitudinal the term *pseudomitotic* is suggested, and this method is subdivided into a method of *post-reduction division* in which the so-called reduction division succeeds the equation division and a method of *præreduction division* in which the reduction division is the first to occur. The possibility of a fourth method in which both divisions are reduction divisions is admitted, but it is held that at present its occurrence is not proved.

An excellent section is also that on the maturation of parthenogenetic ova, in which the question of the development of ova with a subnormal number of chromosomes is considered.

As in the preceding instalment of the work the statement of facts is throughout thorough, clear and well arranged, and opportunity is taken to discuss fairly their bearing on general questions, sections of great interest being devoted to the significance of the numerical reduction of the chromosomes in maturation, to sex determination, to the significance of fertilization, and as an appendix there is added an excellent review of the theories of heredity and the allied theories of differentiation.

The figures are throughout well chosen and reproduced and there is an extensive bibliographical list. J. P. McM.

SCIENTIFIC JOURNALS AND ARTICLES.

The *American Anthropologist* for January–March (Vol. V., No. 1), recently published, contains an exceptionally large number of articles, in addition to the usual book reviews, periodical literature and anthropologic miscellanea. 'The Native Languages of California' are treated, with seven plates, by Drs. Roland B. Dixon and A. L. Kroeber, the classification of these interesting linguistic groups dealing with structural resemblances rather than with definite genetic relationships —the aim being to establish not linguistic families, but types of families. The illustrated article, 'Sheet-Copper from the Mounds is not necessarily of European Origin,' by Mr. Clarence B. Moore, with a discussion by Mr. Joseph D. McGuire and others, is an able presentation of both sides of a long-disputed question in American archeology. Bearing on the same theme is an article by Warren K. Moorehead, 'Are the Hopewell Copper Ob-