

ephemeræformis) weaves a band of silk around the smaller twigs of many trees about the beginning of September. The cocoons remain on the trees over winter and in the great majority of cases drop to the ground in May or June of the following year, because the bands which hold them are torn as the twig increases in diameter. Now and then, however, the bands are so strong that they act as a ligature, causing the swelling of the tissues on one or both sides of the band. The swellings on the upper and lower sides usually join after several years, imbedding the band completely. Swellings were described and shown on soft maple, sycamore, red gum, oak, Virginia pine, sassafras, red cedar, arbor-vitæ, apple, robinia, deodar cedar, willow, cottonwood, cypress.

Several hundred bands were broken to test their strength, and the radial pressure which they exerted on the twig was calculated. As most of the bands are broken by the growth of the twigs every year, these bands were taken as a measure of the energy exerted by the twig. The pressure necessary to break them was determined to be about 35-45 atmospheres per square millimeter. Under pressures of 20-30 atmospheres the cambium still forms wood cells, which differ from the normal wood in having thicker walls, and a smaller lumen. A smaller number of vessels are formed. The results are considered as preliminary and more extended data were promised.

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SCIENTIFIC BOOKS.

Allgemeine Biologie. Zweite Auflage des Lehrbuchs 'Die Zelle und die Gewebe.' Von OSCAR HERTWIG. Pp. 649, mit 371 Abbildungen im Text. Jena, Gustav Fischer. 1906.

This book is a second edition of 'Die Zelle

und die Gewebe,' which originally appeared in two parts, the first dealing with the general morphology and physiology of the cell, in 1892, and the second dealing with the cell in heredity and development, in 1898. Since the publication of the first part fourteen years have elapsed, and eight years since the publication of part two. These have been very fruitful years in the history of the subjects with which Professor Hertwig deals; conceptions of the morphology and physiology of the cell, current at the time of the first edition, have in some cases been greatly enlarged by new discoveries, and in other cases entirely superseded. Facts and ideas of prime importance concerning the chemistry of protoplasm, the so-called tropisms, the phenomena of cell-division, of maturation, fertilization, the physiology of development and the origin of species, have been set forth by numerous writers. The value of the present book must, therefore, be measured largely by the author's assimilation of the new data and by their incorporation within his original system in a logical manner, or else by logical development of a new system rendered necessary by the new data.

Let us see to what extent the new edition measures up to these requirements: (1) The number of pages of the new edition is 649, and of the two parts of the first edition 610; the number of figures has been increased from 257 to 371. There has been, therefore, considerable expansion; in many places new matter has replaced the old, entire sections have been completely rewritten, new sections have been added and there has been a certain amount of rearrangement. The main additions are Chapter IV., dealing with the conception of causation as applied to biology, part of Chapter VIII., dealing with problems of karyokinesis, and most of Chapter XI., dealing with the maturation phenomena of ova and spermatozoa. (2) On the other hand, the author has not attempted to incorporate any of the results of the chemistry of proteids or of the applications of physical chemistry to the study of protoplasm, although there is a chapter on the chemistry of the cell; he has not availed himself of any of the literature

since 1891 in the chapter on the phenomena of irritability (Ch. VII.), although a large part of the most important literature, on the theory of tropisms especially, is more recent; and he has not included any of the data concerning cell-lineage or germinal localization in the parts dealing with the theory of embryonic development, although (or because) these data render his own point of view untenable.

In general, then, though the author has included some of the new literature on certain subjects with which he deals, there are grave omissions of data necessary to the discussion of other subjects with which he also deals. It would be unreasonable to expect an exhaustive treatment of the vast field covered by general biology, and no criticism is due for the omission of certain problems entirely; it is due, however, for the omission of the most significant data in subjects actually discussed.

Professor Hertwig occupies precisely the same theoretical ground that he did at the time of the publication of the first edition. He declares himself in advance against all purely physico-chemical conceptions of the cell (pp. 15 and 16), "since they are fundamentally irreconcilable with the conception of the elementary organism, which runs through this text-book like a red thread." This point of view constitutes at the same time an apology for an inadequate and antiquated treatment of the chemistry of protoplasm. Most biologists will no doubt agree with the author that 'protoplasm is a biological conception,' not a name for a simple chemical substance, and that, even if the chemist could synthesize all kinds of proteids, he would still be far from the synthesis of an organism; but most would value more highly than does the author the contributions from the physico-chemical side to our comprehension of protoplasm.

The second part of the book is essentially a theory of ontogenetic development with its phylogenetic implications; it was originally published as a separate work in 1898, and was reviewed at that time by the present writer.¹ The second edition contains very little matter

that was not included in the first, and the theoretical standpoint is exactly the same; so that the review of the first edition might serve equally well for the second. The author believes in the inheritance of acquired characters, and adopts a Lamarckian point of view in regard to evolution, without seriously examining the difficulties or availing himself of new data; for instance, de Vries' 'Mutationstheorie' is not mentioned, though it bears a date of publication three years earlier than Hertwig's book. Similarly on the side of ontogeny the author finds the full and sufficient explanation of development in the multiplication of cells and in their manifold relations with the environment, again without serious examination of the difficulties and with scant respect for important recent literature.

What was really needed was not a second edition, but a new book, for which Professor Hertwig either had no leisure or lacked realization of the need. It is unfortunate that he should have permitted himself to issue a second edition under such circumstances.

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SCIENTIFIC JOURNALS AND ARTICLES.

The Journal of Infectious Diseases, Supplement No. 2, February, 1906. Some of the papers presented to the laboratory section of the American Public Health Association at the Boston meeting, September 25, 1905:

WILLIAM HALLOCK PARK: 'Some Observations upon the Agglutination of Bacteria.'

EDWARD K. DUNHAM: 'Comparative Studies of Diplococci Decolorized by Gram's Method, Obtained from the Spinal Fluid and from the Nares of Cases of Epidemic Cerebro-Spinal Meningitis.'

MARY E. GOODWIN and ANNA I. VON SHOLLY: 'The Frequent Occurrence of Meningococci in the Nasal Cavities of Meningitis Patients and of Those of Direct Contact with Them.'

OSKAR KLOTZ: 'Temporary Alteration of Character of an Organism Belonging to the Colon Group.'

H. L. RUSSELL and C. A. FULLER: 'The Longevity of Bacillus Typhosus in Natural Waters and in Sewage.'

GEORGE C. WHIPPLE and ANDREW MAYER, JR.:

¹ SCIENCE, N. S., Vol. VIII., No. 198, 1898.