not only by the action of Röntgen rays, but also by extreme heat and by the chemical changes that occur in flames. These cases are considered in the second part of the book. Here also the effects are readily explained upon the theory that the conduction is electrolytic. In fact, it is the development of this theory in its application to the various types of gaseous conduction that constitutes the most characteristic feature of the book. An accidental error in one of the formulas on page 37, whose consequences appear also in some of the equations on the two succeeding pages, may cause annoyance to one reading hurriedly. A serious misprint occurs on page 42, where 10^{-11} appears several times as 10^{11}.

An interesting account is given, in the second division of the book, of the curious effect of light in causing the discharge of *negative* electricity. This effect is produced chiefly by the shorter light waves, and preeminently by the invisible ultra-violet rays of the spectrum. It depends not only upon the gas surrounding the charged body, but also upon the nature of the charged surface. The electro-positive metals, such as zinc, sodium and rubidium, show the effect best. The fact that phosphorescent substances are especially sensitive to this effect, though as yet unexplained, is of undoubted significance.

The third section of the book, devoted to cathode rays, contains an excellent account of the recent experiments on this subject. Such an account is of especial value because of the extraordinary rapidity with which our knowledge of these rays has advanced. It is interesting to note that the study of cathode rays, as well as the study of the other phenomena of vacuum tubes, has received a fresh impetus since the discovery of the X rays; if this study leads to important discoveries, as it now seems almost certain to do, I think that these must be regarded as indirect results of the discovery of Röntgen.

It is quite out of the question to call attention in this brief review to the many interesting and important subjects that are discussed throughout the book. The discussion is often brief and lacking in the detail that would be useful to one making a specialty of the subject. But the book is written by one whose own investigations have contributed largely to the development of each of the topics considered, and who is now engaged in further research along the same lines. This fact gives to the treatment a charm impossible of attainment otherwise, and adds to the book a suggestiveness and inspiration which must appeal to all who read it. ERNEST MERRITT.

Text-book of Physiology. Edited by E. A. SCHÄFER, LL.D., F.R.S. Vol. I. New York, The Macmillan Co.

This new text-book of physiology follows out the idea of combining under one editorship the writings of different men who treat of the special subjects in physiology with which they have had personal and intimate experience. In the face of the great and ever widening scope of the science of physiology, no work of general authority can be written in any other manner to-day.

In illustration of this we find in this volume, which covers merely the chemical side of physiology, reference to fully six thousand original articles. The book is highly creditable to the eleven English physiologists who have contributed to it, and it strengthens the general opinion that in physiology the English are second only to the Germans. The Germans, however, have no such comprehensive and thorough reference text-book as this. The work is hardly one for medical students, but is intended for the teacher, for the advanced investigator, or for reference in the medical library.

The article on the chemistry of the digestive processes is ably written by B. Moore. He attacks the theory of the cleavage of proteid into two molecules, the 'hemipeptone' and 'antipeptone,' for example, and claims that the existence of the 'hemi-' bodies has never been proved. He suggests that trypsin may act on a single molecule of albumose which may yield a greater or lesser quantity of amido acids according to the albumose used, and that the residue of the molecule which cannot be further attacked by trypsin is antipeptone. In the discussion of the composition of the fæces, Moore, in common with almost every text-book of physiology, makes the mistake of giving too

important a place to the residues of the food stuffs, omitting to state that the fæces consists rather of the residues of the excretions which pour into the intestinal tract.

In the article on the 'Chemistry of Respiration,' written by M. S. Pembrey, the statement is made that in Voit's respiration apparatus the moisture expired by the animal may sometimes be deposited in the conducting tubes before reaching the vessel where it is caught and weighed. With proper manipulation, however, this does not take place, and such a statement should not be too lightly made when it tends to invalidate a large quantity of carefully executed work.

The articles by Schäfer himself are characterized by breadth of thought and a balanced judgment which often causes him to make clear a middle ground between opposing theories. In his article on the 'Mechanism of the Secretion of Milk' he is inclined to doubt that milk is the product of the bodily disintigration of the lactic cells, but that, as in formation of saliva, granules are extruded from the cells, which granules dissolve to form the milk.

J. H. Langley has written a very complete monograph on the subject of the Salivary Glands, which includes his own important work.

The other authors are W. D. Halliburton, Arthur Gramgee, E. Weymouth Reid, E. H. Starling, J. S. Edkins, D. Noël Paton and F. Gowland Hopkins, all familiar names to the working physiologist.

The edition published here is identical in make up to that published in England and is everything that could be desired.

Graham Lusk.

University and Bellevue Hospital Medical College, New York City.

SCIENTIFIC YEARBOOKS.

The second volume of *L'Année biologique*, edited by Professor Yves Delage and published at Paris by Schleicher frères, follows the excellent lines laid down in the first volume and represents the best work accomplished hitherto by the various yearbooks recently established in France. The subjects are treated under twenty chapters, each beginning with a critical survey, usually written by MM. Delage and Poirault, followed by a bibliography and abstracts of most of the papers. The digests are often detailed, *e. g.*, the notice of Cope's Primary Factors of Organic Evolution extends to 14 pp., and the account of the contents of a book or paper is usually clearly separated from such criticism as is given. The subjects treated and the number of titles given are as follows:

The cell, 171.
Sexual products and fertilization, 8.
Parthenogenesis, 6.
Asexual reproduction, 12.
Ontogenesis, 52.
Monstrosities, 71.
Regeneration, 46.
Grafting, 10.
Sex and sexual characters, 28.
Polymorphism, metamorphism and the alternation of generations, 29.
Latent characters, *vacat.*
Correlation, 26.
Death, immortality, the germ plasm, 10.
Morphology and general physiology, 275.
Heredity, 57.
Variation, 78.
The origin of species, 110.
Geographic distribution, 50.
The nervous system and mental functions, 203.
General theories, 48.

It is unfortunate that this recently-issued volume refers to 1896, instead of 1897, but the preparation of these 808 large pages represents a great amount of labor for which all students of the biological sciences should be grateful.

M. Binet's *L'Année psychologique* (Schleicher, Paris) combines the publication of special papers with a review of the progress of psychology in 1897. MM. Binet and Vaschide contribute separately and in conjunction no less than twenty-two researches to the present volume, and there are in addition two papers by M. Bourdon and one by M. Leclère. The papers, which deserve special review, are chiefly concerned with the individual differences of school children and contain many interesting suggestions, though, as a rule, the work is not carried far enough to secure definite results. The bibliography, compiled in the first instance by Drs. Farrand and Warren for *The Psychological Review*, contains 2,465 titles, and