

PART II.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

General Physiology : an Outline of the Science of Life,
By MAX VERWORN, M.D., Ph.D. Translated from the
second German edition, and edited by FREDERIC S. LEE,
Ph.D. With 285 illustrations. London: Macmillan &
Co. 1899. Pp. 615.

AT the head of the preface of this remarkable book the following statement stands as a sort of text:—"The elementary constituent of all living substance and the substratum of all elementary vital phenomena is the cell. Hence, if the task of physiology lies in the explanation of vital phenomena, it is evident that general physiology can be only cell-physiology." With the same sentence the work concludes, and this point of view is maintained throughout its course.

As to the class of readers for whom the volume is designed, the author says—"I wished to write something that would appeal first to my fellow-physiologists, and offer them, besides certain new facts and ideas, a summary of our scattered knowledge. But, at the same time, I wished the work to give to any interested scientific reader, whether a student of medicine, philosophy, botany or zoology, an outlook over the problems, facts, theories, and hypotheses of life; in other words, I wished to give him an introduction to general physiology, and thus afford him an idea of the important theoretical basis of his study."

In a short notice of such a work as this it will be impossible to do more than indicate the arrangement of the matter adopted by the writer; but we may say at once that the book, which has enjoyed a great success in Germany, and which has been translated, or is in course of translation, into several European languages, is one of the very highest interest and importance to everyone concerned in any way with biological study. There is no other work of just the same kind in

existence. The nearest to it is Claude Bernard's "*Leçons sur les phénomènes de la vie communs aux animaux et aux végétaux*," published in 1878-9. A comparison of the two works will, however, show how much our knowledge has advanced, and how widely our ideas have expanded in the course of the last twenty years.

The first chapter deals with the aims and methods of physiological research. The problem of physiology is defined as the investigation of life, and some consideration is given to the ideas which we are to attach to the ideas of life and of investigation or explanation. In a brief but very interesting sketch of the history of physiological research, the subject is divided into five periods.

1. The earliest times. Here we find some ideas which sound very modern, such as the notion of the derivation of man from animal-like ancestors originally inhabiting the water, as stated by Anaximander (620 B.C.), the struggle for existence, hinted at by Heraclitus (500 B.C.). "But the theory of Empedocles (504 B.C.) upon the origin of living things is the clearest and most surprising. According to him, plants appeared first, then the lower animals, and from them the higher animals, and finally men were developed by a process of perfection. The effective principle in this perfecting process he perceived in the fact that ill-adapted individuals are destroyed in the struggle for life, while those that are capable of living produce offspring." This is very like Darwinism 2500 years before Darwin.

2. The second period is that of Galen (131-200 A.D.), who first clearly perceived the nature and significance of physiology. He first recognised the importance of anatomical study and of experiments on living animals. The long continuance of his system shows its monumental character, although, no doubt, it was largely due to the darkness of the Middle Ages.

3. The period of Harvey (1578-1657).

4. The period of Haller (1708-1777).

5. The period of Johannes Müller (1810-1858). This great man, to whose memory Professor Verworn dedicates his book, is the father of the physiology of to-day. An appreciative sketch of his work is given, and it is pointed out how

much more comprehensive and philosophical the ideas of Müller are than are those of many of his followers at the present time. There are three great discoveries of the present century which have been already very fruitful, and from the further expansion of which physiology is justified in still expecting great results. These are the law of conservation of energy, the fact that organisms are composed of cells, and the theory of descent in the organic world.

The last section of the first chapter is on the method of physiological research. This includes a discussion of the relation of psychology to physiology, vitalism and cell-physiology.

The second chapter is on living substance, and deals with the individualisation of living substance, its morphological nature, its physical properties, its chemical properties, and the difference between living and lifeless substances. The views of Bütschli on the structure of protoplasm are accepted. "Protoplasm consists of a ground mass, in many cases completely homogeneous, in most cases very finely foam-like or honeycomb-like, in which lies embedded a greater or less quantity of very various solid elements or granules. In the foam-like protoplasm the granules always lie at the corners and angles, where the foam-vacuoles come together, never in the liquid of the bubbles themselves."

While the elements which compose living and lifeless matter are the same, in the former only few elements are found and these chiefly of the lowest atomic weights. "A special vital element does not exist, but the compounds in which these elements occur are characteristic of living substance, and in great part are absent from the inorganic world." They are firstly proteids, which are the most complex compounds known, and are never absent in living substance; further, carbohydrates, fats, and simpler compounds.

The following is the concluding paragraph of this chapter:—"We can thus summarise our considerations so far, and at the same time give a simple expression to the problem of all physiology. *The life process consists in the metabolism of proteids.* If this be true, all physiological research is an experiment in this field; it consists in following the metabolism of proteids into its details, and

recognising the various vital phenomena as an expression of this metabolism, which must result from it with the same inevitable necessity as the phenomena of inorganic nature result from the chemical and physical changes of inorganic bodies.”

The third chapter deals with elementary vital phenomena. It is divided into three sections, the first dealing with the phenomena of metabolism, the second with the phenomena of form-change, including heredity, adaptation, cell division, and fertilisation, and the third with the phenomena of the transformation of energy.

The fourth chapter is on the general conditions of life. It also is subdivided into three sections. The first is on the present conditions, external and internal, of life upon the earth's surface. This highly suggestive section concludes as follows:—“A physical phenomenon takes place when, on the one hand, a material substratum is present in which it can take place, and, on the other, certain external conditions are fulfilled. The same holds good of vital phenomena. Vital phenomena appear with the same necessity that characterises the appearance of physical phenomena; when matter capable of life is present, and when the external general and special conditions of life are fulfilled. In other words, vital phenomena are an expression of the correlation of living substance and the surrounding medium.”

This idea is still further developed in the second section on the origin of life upon the earth. The unsatisfactory nature of all previous theories on this subject is shown in a critical review, and the author draws thus his final conclusions:—“The fact stands out clearly and distinctly that life, from its beginning on, has been dependent upon the external conditions of the earth's surface. In a mathematical sense, life is a function of the earth's development. Living substance could not exist while the earth was a molten sphere without a solid, cool crust; it was obliged to appear with the same inevitable necessity as a chemical combination when the necessary conditions were given, and it was obliged to change its form and its composition in the same measure as the external conditions of life changed in the course of the earth's development. It is only a portion of the earth's

matter. The combination of this matter into living substance was as much the necessary product of the earth's development as was the origin of water. It was an inevitable result of the progressive cooling of the masses that formed the earth's crust. Likewise, the chemical, physical, and morphological characteristics of existing living substance are the necessary result of the influence of the external conditions of life upon the internal relations of past living substance. Internal and external vital conditions are inseparably correlated, and the expression of this correlation is life."

The third section is on the history of death. It is pointed out that there is no sharp limit separating life and death, but rather a gradual transition between them—that death undergoes development. An interesting description is given of the phenomena of necrobiosis, or "those processes that, beginning with an incurable lesion of the normal life, lead slowly or rapidly to unavoidable death." More particularly we would call attention to the description of what is termed granular disintegration. The view of Weismann on the physical immortality of unicellular organisms, which distinguishes them from mortal multicellular organisms, is critically considered and shown to be untenable. In conclusion it is shown that, while we are so ignorant of the composition of living substance, any attempt to produce life artificially must be futile. "For the present the task of physiology can consist only in the investigation of life. When physiology shall actually have accomplished this, it may think of testing the completeness and correctness of its achievement by the artificial inauguration of life."

Our limits forbid us to give any extracts from the fifth and sixth chapters, which deal respectively with stimuli and their action, and the mechanism of life. But we would, however, call attention to the interesting original observations of the author on the reaction of unicellular organisms to electrical and other stimuli detailed in the fifth chapter, and to the reasoning by which all the mechanics of the cell are derived from the metabolism of its substance, as given in the last chapter. It is shown in the successive chapters how the changes of form and energy are inseparably connected with

the change of substance, and while much remains unexplained, and many hypotheses are still necessary, "cell physiology, aided by the stern necessity of its development and its great working power, is beginning to give encouragement to the highest expectations."

This truly remarkable work cannot fail to mark an epoch in scientific literature. The views and arguments formulated in it, and the gradual development of the human mind which has made them possible, are among not the least of the achievements of the century now coming to a close. The book is one not only for the professional physiologist, but for everyone interested in science, or whose culture is sufficient to make him ask what he is, how he came here, or whither he is going. As such it must exercise a widely-spread and important influence. The translation must have been a work of great difficulty, but it has been pre-eminently successful. Professor Lee has given us an English version, which in every page is delightful and fascinating reading, and by this has ensured a greatly extended circle of readers and a more widely-spread influence for the book. The work is one which we cannot too highly recommend to the attention of every cultured man, and more particularly to those who, like our readers, spend their lives in the study of the phenomena of life and death.

Ovariectomy and Abdominal Surgery. By HARRISON CRIPPS, F.R.C.S.; Operator for Abdominal Sections to the Ward for Diseases of Women in St. Bartholomew's Hospital. London: J. & A. Churchill. 1898. 8vo. Pp. 624.

WE are at a total loss to understand how this work can be considered to have Mr. Harrison Cripps for its author, for by far the most valuable portions of it have come from the pens of others, while not a little of that which is accredited to Mr. Cripps is already familiar to those who are in possession of his former writings.

Mr. H. J. Waring is to be congratulated for his excellently illustrated and descriptive chapter on the Anatomy of the Abdomen; the Surgery of the Kidney is from the pen of Mr Bruce Clarke, and will repay our readers' close

perusal ; while to Mr. C. B. Lockwood has been entrusted the chapter dealing with Radical Cure of Hernia, which is excellent so far as it goes.

It is, however, towards Mr. Cripps' portion of the work that we feel compelled to direct a certain amount of criticism, for we look upon it as altogether below the standard that should be expected from the writings of a gentleman holding his high hospital appointments. "I have" (he says) "been so frequently asked during the last few years by old pupils as to the best methods of fitting up an operating theatre in accordance with modern views, that I have described in some detail what has been done with this object in building and furnishing the special theatre attached to the woman's ward at St. Bartholomew's."

It will be perceived that the "best methods" of theatre construction had been asked for, and why then should a full description of "the Martha theatre" be afforded unless the author was fully satisfied with its perfection. The window of this theatre faces the south, a most objectionable aspect from an operator's standpoint, in consequence of the great variability of light and heat, and the dark contrast shadows which accompany sunbeams. A northern light is much to be preferred, as it is free from the above objections. There is a fire-place in Martha's theatre, and this of itself is enough to condemn the whole structure, as it offers an absolute barrier to a still atmosphere so greatly to be sought after when performing an aseptic operation. The wash-hand basins in Martha's theatre are highly praised, but apart altogether from the objection to having basins for preliminary disinfection in the theatre proper at all, the ones described are far from according with modern requirements ; and the "tilt-up basin," which works on a pivot, and can be removed altogether for cleansing purposes, are, we think, vastly to be preferred ; moreover, the water flowing into the basin is controlled by ordinary finger taps instead of the more cleanly feet levers.

Marine sponges are still employed by Mr. Cripps in abdominal sections, and as he does not use these a second

time we must arrive at the conclusion that he believes new sponges to be aseptic, nor does he know of any reliable method of rendering a septic sponge clean. Surely this childlike faith in the cleanliness of a newly purchased sponge is not in accordance with known facts.

If there is one position more important than another in which to place a patient while performing many abdominal operations, it is that of the Trendelenberg, and yet in Fig. 41 this is portrayed in a most incorrect manner, the pelvic elevation not being nearly great enough.

The author in his preface intimates that the object of this book is to record only such details as he himself has found of use. Apparently his experience has not been sufficient to furnish anything but an imperfect index of abdominal surgery. Let us take for example abdominal hysterectomy; extra-peritoneal and sub-peritoneal operations are described and contrasted as though they alone constituted the entire means at the disposal of modern surgery for the removal of myomata. The former is now an operation of the past, nor is there any one point that can be urged in its favour at present, while the latter, sub-peritoneal operation, when performed now, is carried out by methods far in advance of those advocated by the author, as, for instance, the "Kelly operation."

It is, however, probable that panhysterectomy is the operation that will find increasing favour in the future, if it is not already the procedure most constantly carried out nowadays, and yet it appears to have been only on one occasion performed by Mr. Cripps, and this quite unintentionally; neither does it receive any special description.

We now turn to the section dealing with inguinal colotomy, to see whether later experience has modified the author's views as to the advantages of this operation. We find him as great an enthusiast as ever, and so fond of the operation that he himself has performed it in over 300 cases. He refuses to discuss general statistics, and holds that the experience of individual operators of known skill will alone furnish a reliable index as to the usefulness of the operation.

We are told that his own special operation is one of

great nicety, and he has seen "the patient deprived of all the advantages of the operation by its ill performance from want of care or skill on the part of the operator."

To show us how likely his statistics are to be considered reliable, we read that he "had an opportunity of following many of these cases to the end," and "he has no hesitation in saying that the relief obtained, and the suffering avoided, are unmistakable." He again, however, warns his readers that colotomy is an operation of great delicacy, "requiring a good anatomical knowledge, with trained manipulative skill."

The writer has seen Mr. Cripps perform the operation of inguinal colotomy. The asepsis and *technique* may be matters as to which individual opinion may differ; but having watched the case in its subsequent stages, we think that it goes far to justify the opinion expressed by Dr. Gross—namely, "that the operations should be discarded as amongst the obsolete devices of surgery." It is a circumstance also worthy of remark that Mr. Cripps in this instance made no effort to follow up the after-course of the case, which he could easily have done had he so desired, and this, to say the least of it, is surprising in view of the importance he attaches to personal statistics.

Annual and Analytical Cyclopædia of Practical Medicine.

By CHARLES E. DE M. SAJOUS, M.D., and One Hundred Associate Editors. Vol. III. Philadelphia, New York, Chicago: The F. A. Davis Publishing Company. 1899. Svo. Pp. 600.

THE third volume of this enterprising work follows the plan of its predecessors, and carries us in alphabetical order of subjects from "Dislocations" to "Myxœdema," inclusive.

Amongst the most striking articles in this volume are memoirs on "Dislocations and Fractures," by Professor Stimson and Dr. Keyes, junr., of New York; "Hip-joint Disease," by Dr. Reginald H. Sayre, of the same city; "Dysentery," by Dr. Flexner, of Baltimore; "Endometritis," by Professor Byford, of Chicago; "Infantile Myxœdema (Cretinism)," by Professor Osler and Dr. Norton, of Baltimore; "Exophthalmic Goitre," by Professor Putnam, of

Boston ; “Goitre,” by Professor Adami, of Montreal ; “Gout,” by Dr. Levison, of Copenhagen ; “Eczema,” by Professor Stelwagon, of Philadelphia ; and an analytical study of “Hysteria” and “Hypnotism,” by Professor Eskridge, of Denver.

Traumatic Separation of the Epiphyses. By JOHN POLAND, F.R.C.S. London: Smith, Elder & Co. 1898. 8vo. Pp. 926.

Skiagraphic Atlas showing the Development of the Bones of the Wrist and Hand, for the use of Students and others.

By JOHN POLAND, F.R.C.S. London: Smith, Elder & Co. 1898. Royal 8vo.

MR. POLAND'S book on Traumatic Separation of the Epiphyses is the most complete work on this subject which has been given to the surgical profession. It is well that the author has issued separately the Skiagraphic Atlas of the Development of the Bones of the Wrist and Hand for the use of Students, for the size and cost of the complete work will, we fear, prevent its free use by the student; its size indeed renders it a book of reference rather than a text-book for the surgeon, who, however, will be grateful for its completeness and exhaustive character. We doubt if there be a single authentic case recorded that the author omits, and of the more important he quotes the descriptions verbatim. It is this exactness and completeness which has swollen the volume to 926 pages. The numerous (337) illustrations are, almost without exception, excellent. The skiagraphs, which represent the development of the wrist and hand, and are repeated in the Atlas, are very interesting, were it not that they bear too clear evidence of being touched up. There is a sharpness of the contours of the ossifying centres which suggests this. In our opinion a skiagraph should be published as it appears, without any interference. In the skiagraphs of the lesions of the superior epiphysis of the femur we see this—what we may call—tampering with the pictures most evident. Indeed, in one or two of these almost impossible forms are given to the bones; for example, in the representation of the neck of the femur of “a lad aged twenty-one.” Pictures such as

these are very poor value and disfigure the book. The engravings inserted in the text are throughout excellent.

The fulness of the treatment of each epiphyseal lesion may be illustrated by the examination of a particular instance. To the separation of the upper epiphysis of the humerus one hundred and ninety-eight pages are devoted, with thirty-four illustrations; that this development of the subject of this chapter is not excessive is proved by the frequency of the errors of diagnosis which are so constantly occurring. On this point the author says:—

“In a large proportion of the cases described above a diagnosis of dislocation was at first made. Jetter says that out of seven cases operated on for deformity and loss of function of the arm after union had taken place, the displacement had, on five occasions, been diagnosed as a dislocation, and attempts at reduction had been made by the medical attendant.

“As late as June, 1893, we find (according to Lejars) a case being mistaken at one of the French hospitals, and vain attempts made at reduction by Kocher's method.

“Dr. J. F. Erdmann, of New York, mentions (*New York Medical Record*, October 26, 1895, p. 586) the case of a boy (M. M'G.) aged sixteen, who had fallen upon his shoulder six weeks before. He had been an inmate of one of the large New York hospitals, and was being treated for a sub-coracoid dislocation of the humerus. There was no swelling, but marked flattening of the shoulder, broadening from before backwards, and $1\frac{1}{4}$ inch shortening. A slightly convex deformity, continuous with the shaft, with the bicipital groove well marked upon it, was found beneath the acromion, and downwards and in front, practically sub-coracoid, a round, fairly-moveable mass was felt. A diagnosis of epiphyseal separation was then made and operative treatment recommended, but refused. The author has seen the same mistakes made at the hospitals in London.”

When, then, these mistakes are so common all the world over, and at the great seats of surgical teaching, we need not complain of our author devoting so many pages and illustrations in the hope of teaching the surgical profession the diagnosis of separation of the upper epiphysis of the humerus.

An examination of any other particular instance gives very much the same result. Lastly, each epiphyseal study is made very practical and complete by the discussion and illustration of the best mode of treatment. We can, therefore, commend this book with all confidence to the profession.

The Royal University of Ireland. The Calendar for the Year 1899. Dublin: Alex. Thom & Co. 1899. 8vo. Pp. 463.

THE Calendar contains the usual information relative to the University and its several faculties. Changes in the courses and in the regulations for 1900 will be found at page 195, and should be consulted by all intending candidates. In October, 1900, one medical studentship, tenable for two consecutive years, of the annual value of £200, will be offered for competition among the Graduates in Medicine of the University. The subjects for examination will be Pathology and Bacteriology.

Burdett's Official Nursing Directory, 1899. Containing an outline of the Principal Laws affecting Nurses; particulars of Nurse Training Schools in the United Kingdom and Abroad; Nursing Institutions, &c., and a Directory of Nurses. Compiled and Edited, with the assistance of a small Committee of Medical Men and Matrons, by SIR HENRY BURDETT, K.C.B. London: The Scientific Press. 8vo. Pp. 672.

THE nursing world is much indebted to Sir Henry Burdett, and we are glad to see an increase in the number of nurses' names in his Directory this year. We, however, look in vain for many Irish names well and honourably known to us, and we would urge upon all the duty of responding to the request of the editor, by filling in the forms which are sent to them. Under the heading of "Institutions Managed by a Committee," we regret to find that the notice of "The St. Patrick's Nurses' Home for supplying Trained Nurses to the Sick Poor," which appeared last year, has been obliterated. This needs some explanation. An institution established 23 years ago, and supporting a *permanent* staff of eight nurses, claims individual notice.