

## SCIENCE:

A WEEKLY NEWSPAPER OF ALL THE ARTS AND SCIENCES.

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Attention is called to the "Wants" column. All are invited to use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

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WE HAVE RECEIVED the prospectus of Barnard College, the institution founded last year in New York to enable women to receive collegiate instruction from the professors of Columbia College. The two corporations are distinct; but Columbia furnishes the teachers for the women's college, and confers the degrees upon its graduates. The new college was named after the late President Barnard of Columbia, in gratitude for his efforts in behalf of the higher education of women. The pamphlet now before us contains the requirements for admission to the Barnard, together with the courses of study during the freshman and sophomore years. The requirements for admission consist of the elements of Greek, Latin, and mathematics, with English grammar and composition and some history and geography. The studies of the first two years are in the same departments, with the addition of chemistry and botany and the French and German languages. It will be seen, therefore, that the founders of the new institution are no innovators, but have adopted the course of study usually pursued by young men. The studies thus far announced seem rather too largely technical, but probably those of the junior and senior years will be less so. Several post-graduate courses are also provided, with opportunity to obtain the degrees of master of arts, doctor of philosophy, doctor of letters, and doctor of science. On the whole, the programme promises well, and every friend of humanity will wish the new college God speed.

## THE MARINE BIOLOGICAL LABORATORY.

THE third session (1890) of the Marine Biological Laboratory will be held this summer. The corps of instructors consists of Dr. C. O. Whitman, director, professor of zoölogy, Clark University, editor of the *Journal of Morphology*; Howard Ayers, Ph.D., director of The Lake Laboratory, Milwaukee; E. G. Gardiner, Ph.D., instructor in zoölogy, Massachusetts Institute of Technology; I. Playfair McMurrich, Ph.D., docent in zoölogy, Clark University; J. S. Kingsley, Sc.D., professor of zoölogy, University of Nebraska; H. C. Bumpus, M.A., fellow in zoölogy, Clark University; W. M. Rankin, Ph.D., Princeton College; W. A. Setchell, B.A., assistant in botany, Harvard University; Takano Ryoiche, artist; G. W. Fitz, laboratory assistant.

In addition to the regular courses of instruction in zoölogy, botany, and microscopical technique, consisting of lectures and laboratory work under the direct and constant supervision of the instructors, there will be two or more courses of lectures on special subjects by members of the staff. One such course of six lectures will be given by Dr. McMurrich on the *Hydrozoa*. Similar courses on the *Crustacea* and echinoderms will be given by Professor Kingsley and Dr. Rankin. There will also be ten or more evening lectures on biological subjects of general interest. The first of these will be given by Dr. Whitman on July 9. Among those who may contribute these lectures and take part in the discussions upon them may be mentioned, in addition to the instructors above named, the following: Professors E. B. Wilson of Bryn Mawr, C. S. Minot of Harvard Medical School, W. T. Sedgwick of the Massachusetts Institute of Technology, S. F. Clarke of Williams College; Dr. G. Baur, recently of Yale University; Dr. Henry Orr, recently of the Universities of Jena and Princeton; Dr. C. H. Eigenmann, recently of the University of Indiana; Professor W. A. Lacy of Lake Forest University; and William M. Wheeler of Milwaukee.

The laboratory is located on the coast at Wood's Holl, Massachusetts near the laboratories of the United States Fish Commission. It has already been found necessary to add to it this year a library, a lecture-room, and six more private laboratories. The building consists of two stories; the lower for the use of students receiving instruction, the upper exclusively for investigators. The laboratory has aquaria supplied with running sea-water, boats, collecting apparatus, and dredges; it will also be supplied with alcohol and other reagents, glassware, and a limited number of microtomes and microscopes. By the munificence of friends the library will be provided henceforth not only with the ordinary text-books and works of reference, but also with the more important journals of zoölogy and botany, some of them in complete series. If the necessary funds can be obtained, the laboratory will also be provided with a steam-launch, and in any event there will be opportunities for collecting material for study and investigation.

The laboratory for investigators will be open from June 2 to Aug. 30. It will be fully equipped with aquaria, glassware, reagents, etc., but microscopes and microtomes will not be provided. In this department there are fourteen private laboratories supplied with aquaria, running water, etc., for the exclusive use of investigators who are invited to carry on their researches here free of charge. Those who are prepared to begin original work, but require supervision, special suggestions, criticism, or extended instruction in technique, may occupy tables in the general laboratory for investigators, paying for the privilege a fee of fifty dollars. The number of such tables is limited to ten. Applicants for them should state precisely what they have done in preparation for original work, and whether they can bring a complete outfit; viz., microscope, microtome, camera-lucida, etc. Special attention is invited to the opportunities offered to the holders of these tables, as it is believed that they are somewhat unusual.

The laboratory for students will be opened on Wednesday, July 9, for regular courses of seven weeks in marine zoölogy and botany, and microscopical technique. Opportunities will be given for collecting and preparing material for use in the class-room and for special lines of study. Hand-lenses, dissecting-instruments, drawing-materials, etc., may be bought at cost in the lab-

oratory. It is desired that students owning microscopes or microtomes should bring them, and applicants for admission should state whether this requirement can be complied with. The fee for workers in this department is twenty-five dollars, payable in advance. The number of students will be limited to thirty, and preference will be given to teachers or others already qualified. By permission of the director, students may begin their individual work as early as June 15 without extra charge, but the regular courses of instruction will not begin before July 9. Applications for places in either department should be addressed to Miss A. D. Phillips, secretary, 23 Marlborough Street, Boston.

The Marine Biological Laboratory is intended to continue and enlarge the work of the laboratory at Annisquam, carried on for six years by the Woman's Education Association, with the co-operation of the Boston Society of Natural History. The annual reports of the trustees, containing an account of its organization and work, may be obtained from the secretary.

#### BOOK-REVIEWS.

*The Anatomy of the Frog.* By Dr. ALEXANDER ECKER. Tr. by George Haslam, M.D. Oxford, Clarendon Pr.; London, Henry Froude; New York, Macmillan & Co.

THIS volume is No. II. of the "Translations of Foreign Biological Memoirs." The first part of Ecker's "Anatomie des Frosches" appeared in 1864, and the second part sixteen years later. This was the groundwork on which Dr. Haslam prepared his "Anatomy," adding many facts which he deduced from his own personal investigations, and in general bringing the book up to date by including the results of recent researches. It may seem to many rather peculiar that so much labor should have been expended on the study of the minute anatomy of so insignificant a creature as the frog; but when it is remembered that for many reasons the frog has for years been studied by scientific men to elucidate intricate physiological problems, and that to-day no animal is more commonly found in physiological laboratories than the frog, this peculiarity will cease to exist. It would be interesting, did our space permit, to review the intimate relations which the frog has sustained to important discoveries. Swammerdam, more than two hundred years ago, called attention to the advantages which the frog possessed as an aid to scientific study. It was from accidentally observing the contractions of the muscles of the denuded hind-legs of a frog that Galvani was led to abandon all other occupations and investigate the phenomena which were the basis of Galvanism.

Our knowledge of the capillary circulation of the blood rests upon Leeuwenhoek's observations of the web of the foot of this animal, and the gills and tail of its tadpole; and to-day the frog affords almost the only material for the investigation of the excitability of nerve and its associated electromotive changes. Histology is also deeply indebted to the frog for its present status. The structure of nerve-fibres, their origins and terminations, and the structure of muscular fibres, have all been studied more in the frog than in any other creature. These and many more reasons might be given in justification of devoting so much time and labor to the preparation of a book of such size on such a restricted subject. As a book of reference, the volume is invaluable to every biological student. It is very complete in all its parts, besides being admirably printed and illustrated. Taken as a whole, it might well serve as a model to all publishers. The paper and the type are especially worthy of commendation.

*Practical Electricity in Medicine and Surgery.* By G. A. LIEBIG, Jun., Ph.D., and GEORGE H. ROHÉ, M.D. Philadelphia and London, F. A. Davis. 8°. \$2.

ELECTRICITY is becoming more and more each day an important adjunct to both the physician and the surgeon in their battle with disease. Whereas a few years ago no one but a specialist was expected to know any thing about the practical application of electricity in medicine, to-day many physicians in general practice, and laying no claim to being specialists,

have in their offices the appliances necessary for the treatment of disease by electricity. Drs. Liebig and Rohé have therefore, in issuing this book, supplied a guide in a comparatively new field, to those who have up to this time failed to find in the literature of the subject all that was necessary to enable them intelligently to make a practical use of so important an agent as electricity.

This volume is divided into three parts. In Part I. the various forms of electrical and magnetic apparatus are described which are likely to be of use to the physician, together with the best arrangements of cells for any given work, the construction and use of galvanometers, the theory of the chemical action taking place in the storage-cell, and the best methods of caring for batteries. The electric motor, the telephone, and the phonograph are also here described. Part II. describes the effects of electric current upon the body in health and disease. Part III. treats of the application of electricity to the treatment of disease.

The work is a most valuable contribution to the elucidation of a most intricate subject, and coming just at this time, when there is such a general interest in the manifold applications of electricity, must receive a cordial welcome not only from members of the medical profession, but also from scientists generally.

*Notes on American Schools and Training Colleges.* By J. G. FITCH. New York, Macmillan & Co. 16°. 60 cents.

THIS little book, reprinted from a report to the English Education Department, contains the observations made by the author after a visit to the schools of this country. Mr. Fitch's opinion of American public schools is in the main very favorable; and the criticisms he makes on particular points, together with his occasional comparisons between our schools and the English, ought to be useful to American educators. The chief excellence that he notes in our school system is the enthusiasm shown, not only by teachers, but by the public as well; while the chief defect, in his opinion, is the excessive minuteness with which the lessons and the mode of teaching them are prescribed, so that nothing is left to the spontaneity and originality of the teacher. He dwells upon this topic at considerable length, remarking that "text-books and certain accepted formulas appeared to dominate the work of the classes too much," and adding that English teachers would find such minute regulations an intolerable restraint. He maintains at the same time that the English elementary schools give as good an education as those of this country. With regard to training-colleges, or, as we call them, normal schools, Mr. Fitch thinks we are as yet but poorly equipped, the number of such institutions being far too small for the work required. He notes, however, that certain other modes of training supply to some extent the place of normal schools; and he dwells with special interest on the teachers' associations and reading-circles, which he regards as admirable features of our educational system. As he came here to study the public schools, he has very little to say about the colleges and universities, what he does say relating almost exclusively to the worthlessness in general of American college degrees, — a matter that has been much discussed among ourselves, and as to which the author's remarks are not a whit too strong. We commend the book to the notice of American educators.

*Practical Electrics: A Universal Handy-Book on Everyday Electrical Matters.* New York and London, Spohn. 8°. 75 cents.

THIS practical volume is a reproduction of a series of papers on electrical subjects which originally appeared in the third series of "Workshop Receipts." It is intended mainly for that large and rapidly growing class of scientific amateurs and conscientious artisans who, through inclination or necessity, are led into the field of electrical practice without having time or opportunity to make a thorough study of the subject. In other words, it contains a fund of information of an eminently useful and practical character, though not what