Fear. ANGELO MOSSO. Translated from the fifth edition of the Italian by E. Lough and F. Kiesow. London, New York and Bombay, Longmans, Green & Co. 1896. Pp. 278.

Prof. Mosso is one of the most eminent of modern physiologists, and he is an Italian. This book bears ample witness to both facts. It is largely occupied with descriptions of the author's ingenious experiments on the cerebral blood-supply, and is written with naïve openness, eloquence and assurance that read more oddly in the English translation than in the original Italian.

The book not only describes the emotions, but also expresses them and appeals to them. It contains graphic descriptions of convivial feasts and death-bed scenes, even of a syphilitic woman and of a head cut off from the body. We are told of the author's feelings at his mother's grave and on which side of the face his sister blushes. The book is expressly intended for the general public, but will probably, in the Anglo-Saxon race at least, contribute less to its instruction than to the morbid appetite already sufficiently fed by the daily newspapers.

The first half of the book discusses chiefly the functions of the brain and spinal cord, and more especially the relation of the circulation of the blood to emotional disturbances. It is well known that we owe to Prof. Mosso the method of measuring the decrease in the volume of the extremities of the body due to congestion of the brain when it is excited by mental activity, the balance showing the movement of blood to the brain, and many other important investigations on cerebral circulation. Mosso's work in this field is of much value and originality, and it is an advantage to have it accessible in English, even though the method of presentation is not very systematic nor scientific.

The second half of the book is concerned chiefly with the expression of the emotions, not being confined exclusively to fear. Mosso argues against the view that the expression of the emotions must of necessity be useful to the individual. As the translation makes him say 'Spencer and Darwin were not physiologists enough.' It is undoubtedly true that certain expressions of the emotions are pathological. Trembling, as an effect of fright, is probably no more useful to the individual than *paralysis agitans*. There are evident limits to the adaptability of the organism. The nervous system best suited to respond to ordinary stimuli may and does fail in the presence of unusual conditions. Mosso does not accept Mantegazza's extraordinary theory that a frightened animal trembles to keep its blood warm, but he holds that this is the reason why its hair stands on end!

The psychology in the book is not such as to warrant serious criticism. Mosso writes:

> "We imagine that the impressions of the external world form a current which penetrates the nerves, and without either abatement or check, diffuses and transforms itself in the centers, finally reappearing in the sublime form of the idea; this is the notion of the soul held by the philosophers of remote antiquity; this is the base of modern psychology."

Indeed, the book does not appear quite contemporary; there is no discussion of the relation between pain and sensation, nor of the James-Lange theory of emotions, according to which the expression is the cause of the emotion and not conversely. The heredity of acquired characters is taken as a matter of course. We are told "civilization has remodeled our nerve-centers; there is a culture which heredity transmits to the brains of our children."

The reader who looks for an index will find in its place a twenty-four page catalogue of Messrs. Longmans, Green & Co.'s publications.

J. MCKEEN CATTELL.

Naturwissenschaftliche Einführung in die Bakteriologie: By FERDINAND HUEPPE, University of Prague. 268 pp. C. W. Kheidel, Wiesbaden, Pub.

Books upon bacteriological technique have been somewhat common in recent years but nothing has hitherto appeared, which, leaving out laboratory methods and systematic details, gives a summary of the important discoveries of modern bacteriology. The reputation of the author of the present work as one of the leaders in modern bacteriology is a sufficient guarantee of its value from a scientific standpoint, and the subjects treated are a sufficient guarantee of its interest. To one who wishes to know what bacteriology has accomplished and what prob-

lems are still undergoing solution nothing can serve better than this outline of Prof. Hueppe.

Beginning with a brief yet complete treatment of the morphology of bacteria and their relations to other groups of plants, the author passes to a consideration of their relations to their environment. Valuable sections are given upon the effects of light, temperature, oxygen, poisons, etc. He treats of the effect which bacteria have upon the medium in which they are growing, of the products to which they give rise, as well those produced by the decomposition of the culture medium as those produced by synthesis and as secretions. He deals of the subject of the food necessary for the life of the various organisms, and in this section, in short, gives a general survey of the relations of bacteria to the environment, thus indicating how and why they may play an important part in nature's processes.

A summary of the relations of bacteria to diseases follows. The different types of germ diseases are distinguished and their relations to micro-organisms. The discussion is more than a simple collection of facts. It brings into prominence the distinction between strictly pathogenic bacteria and those which are pathogenic only under special conditions, between those which are always injurious and thus strictly parasites, and those which are normal harmless occupants of the human body, but which occasionally produce trouble. It emphasizes the personal factor in the matter of infection or in preventing the invading organisms from developing. The discussion can hardly fail to clear our notions, since it gives a sharp and happy summary of our present knowledge of the relation of various diseases to parasites and of the individual to the infecting bacteria.

The most novel and original part of the book is the somewhat extended discussion of the causes of disease and the methods which bacteriology is promising as a means of meeting the various diseases. This subject is too comprehensive and too condensed for summary. The author finds the potent cause of disease rather in the organism itself, looking upon the pathogenic organism simply as a stimulus. He succeeds well in disentangling the miscellaneous confusing facts which have accumulated in the last few years upon the matter of toxines, antitoxines, protective and curative serums, immunity, etc., reducing the subject to something like logical completeness. In this section we see much more than simple compilation of facts and can recognize the author's personality in the method of treatment. Even Prof. Hueppe, however, is not able to reduce this matter to anything like clear logic, since our present knowledge is so largely filled with lacunæ. At best, the matter of immunity and toxines must be left with many questions. It is impossible to read this discussion of toxines and antitoxines, nucleins, phagocytosis, active and passive immunity, etc., without having a better notion of the proper bearing of the different phases of the subject.

This work of Prof. Hueppe is useful to two classes of readers. Those who are not bacteriologists, but who desire to learn the general facts which the last quarter of a century has discovered, will find here a brief but intelligible summary. Those who are already familiar with the general facts will, perhaps, find the book of even more value in giving a clear and simplified conception of the various confusing facts which have so rapidly accumulated in recent years.

H. W. Conn.

SCIENTIFIC JOURNALS.

THE ASTROPHYSICAL JOURNAL, APRIL.

The opening article, by Prof. J. Wilsing, contains a short discussion of previous papers on the law of the sun's rotation. The differential currents on the sun's surface are shown to be results of earlier conditions of motion, and can be destroyed by internal friction only. The least time in which changes of the surface currents would become perceptible is calculated to be millions of years.

In a report on solar observations for the second half of 1895, by Prof. Tacchini, there is shown a continued decrease in the number of spots, with a secondary minimum in November. There was a disproportionate decrease in prominences with a minimum in October.

In discussing the spectrum of Mars, Prof. Lewis E. Jewell contends that spectroscopic proof of the presence or absence of water in the