LECTURES ON ELECTRICITY AND LIGHT.

Leichtfassliche Vorlesungen über Elektrizität und Licht. By Prof. Dr. G. Jaumann. Pp. xii + 375. (Leipzig: Barth, 1902.) Price Mk. 6.

IN a book of 370 pages it is quite impossible that the subjects of magnetism, electricity and light could be treated in anything but a scrappy manner, so that we cannot expect from Prof. Jaumann anything more than a general view of the subjects treated. The book under review arose from a course of lectures at Prague for beginners at the University and teachers in the secondary schools, and is therefore of the nature of an outline to be used as a guide in study supplemented by other more technical reading. For this purpose, if there had been a good selection of references to standard treatises, the book would have been admirable; but, unfortunately, references are almost entirely absent. The author has undoubtedly made a most interesting volume and has treated the subject in a very original manner, dealing with the phenomena of magnetism, electricity and light from a physical point of view, using throughout the Faraday conception of tubes of force. The first eighty-four pages consist of an introduction dealing with stationary stream lines in the motion of a liquid to lead on to the conceptions of magnetic and electric lines of force. The analogies between liquid stream lines due to sources and sinks and vortices and lines of force due to charges and electric currents are well brought out, and considerable ingenuity is exercised in constructing cases of fluid motion to be analogous to the behaviour of lines of electric force when more than one dielectric is present in the field. It seems, however, curious to introduce, for the benefit of readers who cannot be supposed to understand lines of force, the lines of flow for a vortex filament in a steady stream as the first case of stream lines discussed. However, later on the author deals with the resultant of two sets of stream lines and shows how complicated cases can be built up out of simple cases. This might have been done at first and have led up to the more complicated and confusing cases which he presents to the reader at the very beginning. By means of a hot or cold region in the centre of a stream, he constructs stream lines which are analogous to the lines of force for a dielectric cylinder in a steady uniform electric field. The hot region is supposed to be produced by the sun shining on this part of the stream, the rest being in shadow. As a limiting case he has a region of vapour in the middle of the stream, and states in a footnote:—

"The conditions for a stationary state of flow with a region of vapour in the middle of the stream through which the water continuously flows are left undiscussed."

This part of the book is the most interesting, but it is somewhat questionable whether the method would be really of use to a student.

The electrical and magnetic parts of the book are clearly and, on the whole, well done, in spite of the limited space at the author's disposal. The elementary parts of electrostatics are very clearly and concisely explained. There are some points which are somewhat carelessly treated—for example, it is too much to say that the process of solution of zinc in sulphuric acid is completely explained by an electrolytic decomposition due to small currents set up on the zinc producing zinc oxide and setting free hydrogen, the zinc oxide then dissolving in the acid. It is difficult to see how this is a complete explanation.

The last few pages are concerned with Röntgen, Becquerel and kathode rays. The author here is rather unfortunate, as he makes several wrong statements, *e.g.* kathode rays charge bodies on which they fall frequently with a negative, but more often with a positive charge. Also Röntgen rays are stated to be probably light rays of smaller wave-length than ultra-violet rays, and kathode rays are stated to be probably longitudinal electric waves. These statements seem extraordinary in view of the Stokes-Thomson theory of Röntgen rays and the universally accepted emission nature of kathode rays.

The illustrations are good, but sometimes superfluous—for example, on p. 270 is an illustration of a dynamo attached to a steam engine, with no description whatever in the text, and the illustrations of telescope and microscope have no accompanying description.

On the whole, the book is very interesting and would prove extremely useful to students who have already been introduced to the elementary facts of the subjects.

OUR BOOK SHELF.

The Principles of Mechanics. Part i. By Frederic Slate, Professor of Physics in the University of California. Pp. x+299. (New York: The Macmillan Company; London: Macmillan and Co., Ltd., 1900.) Price 7*s.* 6*d.* net.

A Treatise on Elementary Dynamics. By H. A. Roberts, M.A. Pp. xi + 258. (London: Macmillan and Co., Ltd., 1900.) Price 4*s.* 6*d.*

AN interesting contrast can be made between these two little treatises on the methods of mathematical instruction in this country and America.

The English book is still full of elegant little calculus-dodging expedients, and no differential coefficient is allowed to appear, as it is intended for candidates for mathematical scholarships, who are still kept marking time so long over coordinate geometry as never to arrive at the calculus.

The American professor, on the other hand, addresses a class of college students of about the same age, but who have brought to their task a working knowledge of the calculus, as well as a good groundwork of experimental physics. This knowledge of experimental facts will enable the student to follow Prof. Slate's somewhat metaphysical presentation of the subject. Mr. Roberts has also incorporated the views of modern writers on the laws of motion, based mainly on Mach's "Science of Mechanics." This will make these treatises useful to students who are to become teachers in their turn; but Prof. Perry will say that they are unsuitable for the class of student he has in his mind, as the exercises and illustrations are throughout of the usual academic type, devoid of reality, or else based on microphysical conceptions.

Studien ü. d. Milchsaft v. Schleimsaft der Pflanzen. Von Prof. Dr. Hans Molisch. Pp. viii+109. (Jena: Gustav Fischer, 1901.)

PROF. MOLISCH gives a general account of the occurrence of laticiferous tissue and mucilage cells in plants, treating his subject specially from the point of view of the latex itself. He finds that the fluid is commonly acid or sometimes neutral in reaction, thus differing in this respect from protoplasm. He finds a curious form of vesiculated nucleus to be of common occurrence, and