find as much about the one half of living nature as about the other in it.

The most fruitful source of progress is a new way of looking at things, and such new points of view result in the destruction of old classifications and the need for new ones; in biology, investigators will soon cease to be classified according to the group of animals or plants with which they deal, but according to the particular phase of the problem of the "fundamental nature of living things" (which is the ultimate goal of biological inquiry) which interests them. In the study of heredity, for example, there is already a number of investigators who are as familiar with that phenomenon in the case of animals as in the case of plants. Nor does it seem reasonable to doubt that, by thus broadening the basis of material used by the investigator, the conclusions arrived at by him are likely to be less wide of the truth than they are apt to be if they are based on the result of experiment with a single animal or plant. The moral of this is, not that Prof. de Vries ought to have said something about animals in his book, but that the disappointed zoological reader ought to know something about plants for the sake of his work.

To bestow praise on any work of Prof. de Vries would be impertinent; to cite points of particular interest in the book is unnecessary, for it has already begun to form part of the indispensable equipment of the student of evolution in the broadest sense of that term. A. D.

ASPHALT PAVEMENTS.

The Modern Asphalt Pavement. By Clifford Richardson. Pp. vii+580. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1905.) Price 12*s.* 6*d.* net.

THIS is a book dealing with an important practical subject which up to the present time has not received much attention from writers of text-books. Asphalt pavements of various kinds are now so largely used that a text-book dealing with this subject has been a long-felt want.

The book is divided into sections, and the author has appended to the end of each chapter a brief summary of the matter dealt with, enabling the reader to determine quickly whether or not the chapter contains the information he is seeking for. The first section deals with the construction of the road base upon which the surface carrying the traffic is supported, and it is evident that Mr. Richardson is of opinion that the ideal base is hydraulic concrete. Between this base and the surface proper is interposed a binder, or intermediate, course; where the traffic is heavy, the best material for this is a layer of compact asphaltic concrete. The next section is concerned with the materials employed in making the asphalt surface mixture, and a detailed account is given of the sands used for this purpose and of their origin and physical characteristics. After a brief explanation and classification of the various hydrocarbons of which native bitumen is composed, the author describes the native bitumens which have so far been used in paving work.

In section iv. the technology of the paving industry is taken up; the preparation of the surface mixture is explained with the help of elaborate tables, and the theory which underlies the practical work is described; the author points out that an asphalt surface in order to be successful must resist both weathering and impact. The mechanical appliances used for combining the various materials into the surface mixture are described with diagrams.

Sections v. and vi. deal with the handling of the material in the street and with the hand-tools needed by the workmen, and in the latter section a description of an ingenious machine for impact tests is given. In section vii. there is a complete specification for an asphalt pavement; this will be found of great value to engineers who have to draw up specifications for work of this nature. Mr. Richardson points out that the popular idea as to the limiting gradient for an asphalt pavement is erroneous, and that in the eastern part of the United States, for example, a gradient of 8 per cent. on an asphalt road is not excessive. There is no doubt that asphalt has great advantages when compared with most of the other pavement materials; it is free from mud if properly washed down at regular intervals; unlike wood, it is practically non-absorbent; when kept in a clean condition it gives a good foothold for horses; tractive effort is considerably reduced, and even under heavy traffic asphalt wears remarkably well. Although the initial cost is heavy, still the cost of upkeep is lower than that for most of the other paving materials. The last section of the book, one of the most valuable, deals with the testing of the various materials used in asphalt pavement work; it gives a complete account of this necessary branch of the work, and data are given of the equipment required in a municipal laboratory where such testing work is carried out.

The book is likely to prove of great value to municipal authorities who are faced with the problem of determining the most satisfactory road material to employ both where traffic is heavy and where it is moderate. T. H. B.

OUR BOOK SHELF.

Die physikalischen Eigenschaften der Seen. By Dr. Otto Freiherr von und zu Aufsess. Pp. x+120. (Brunswick: Vieweg and Son, 1905.) Price 3 marks.

THERE are many books and pamphlets dealing with one or several of the properties of lakes; the aim, however, of the present work is to gather into a handbook the principal facts known, and to give a general view of the results arrived at, so as to incite the lover of nature to interesting observations as well as to provide a guide for the more specialised limnologist.

In a short introduction the author deals with Prof. Forel's work as having caused the important development of limnology which recent years have witnessed, and gives this authority's definition of a lake as being "a mass of still water, closed up on all sides, situated in a depression of the ground, without direct communication with the sea." The lake surface being a part of the earth surface represents a section of a sphere, the curvature of the same being, with large