

dyne is wrongly defined, velocity is wrongly expressed. In a number of cases equalities and proportionalities are used indiscriminately. In fact, the book is logically weak, as would be expected from the author's statement that "inquiry into the rules of dynamics would carry us too far afield." Much dynamics and much mathematics are wholly unnecessary for the purposes of this work, yet its merits would be greatly increased by the more exact use of the little necessary. The book is provided with a good table of contents and a good index. It is well bound and excellently printed. The misprints noted by the reviewer are exceedingly few.

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*Arbeiten aus dem Gebiet der Experimentellen Physiologie.* Herausgegeben von Dr. HANS FRIEDENTHAL in Nicolassee bei Berlin. Mit 4 Tafeln und 14 Figuren im Text. Jena, Gustav Fischer. Pp. 493. 1908. Price, 8 Marks.

This collection of papers by Dr. Friedenthal and his collaborators has been prepared in order to bring together a number of contributions scattered throughout various scientific journals, some of which are not easily accessible, and to make them readily available to physiological readers. They have been arranged by the editor, with relation to their content, into the following groups: biological relationships among animals and plants; papers on physiological operative technic, including studies on absorption, the innervation of the heart, and the sympathetic system; studies on physical and physico-chemical topics; papers on the H-ion concentration and the reaction of living substance; and additional contributions of diverse character.

It is impossible here to refer individually to the 55 papers reprinted. Many of them are already quite familiar to biological and physiological workers. This applies, for example, to studies such as those dealing with the fate of foreign sera introduced into the circulation of animals, and with the nature of the forces coming into play during the act of absorption. Friedenthal defends the view that solubility in water is per se insufficient to determine the

possibility of absorption of substances by cells. We are asked to distinguish between solubility in protoplasm and solubility in water; herein the now well-recognized importance of the cell lipoids for the processes under discussion is duly emphasized. The author has furthermore especially insisted upon the absence of special "vital" forces in absorption.

Friedenthal's earlier observations on the biological relationships of animals and the position of man in the zoological scheme were perhaps not as widely known at the period of their publication as they deserved to be; the so-called "immunity" reactions which were shown in common for man and the anthropoid apes have since been more extensively observed.

Some of the observations on the occurrence and nature of enzymes have more recently lost the significance attributed to them when they were first published. Thus Friedenthal's announcement of the existence of an amylolytic enzyme in the gastric juice of dogs is probably referable to the regurgitation of intestinal contents (including pancreatic secretion) into the stomach—a phenomenon shown by Boldireff to occur with frequency in these animals.

The most significant of all the reprinted papers are, perhaps, those dealing with the reactions of the blood and protoplasm. Friedenthal was among those first to point out the non-existence of an alkaline reaction in the blood in reference to indicators sensitive to carbonic acid; and he showed the importance of the alkali bicarbonate of the serum as a regulatory factor in preventing marked variations from neutrality. These investigations were followed by the publication of a comparatively simple method for the estimation of the reaction of physiological fluids by the use of a series of indicators. The method, which has already found application in the study of physiological problems, is likely to be a help in future research, especially in the study of such questions as acidosis.

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