SCIENCE

FRIDAY, NOVEMBER 12, 1920

CONTENTS

MSS. intended for publication and books, etc., intended for review should be sent to The Editor of Science, Garrison-on-Hudson, N. Y.

THE PROTEINS AND COLLOID CHEMISTRY[1]

I

THE proteins, like certain other constituents of protoplasm, are colloidal in character, *i. e.*, they are not able to diffuse through animal membranes which are permeable to crystalloids. For this reason a number of authors have tried to explain the behavior of proteins from the viewpoint of the newer concepts of colloid chemistry. Foremost among these concepts is the idea that the reactions between colloids and other bodies are not determined by the purely chemical forces of primary or secondary valency but follow the rules of "adsorption." Although a number of authors, during the last twenty years, *e. g.*, Bugarszky and Liebermann, Hardy, Pauli, Robertson, Sörensen, and others, have advocated a chemical conception of the reactions of proteins, their experiments failed to convince the other side since these experiments could just as well be explained on the basis of the adsorption theory. There were two reasons for this failure. First, the experiments did not show that ions combined with proteins in the typical ratio in which the same ions combine with crystalloids. This proof only became possible when it was recognized that the hydrogen ion concentration of the protein solution determines the amount of ion entering into combination with a protein, and that therefore the ratios in which different ions combine with proteins must be compared for the same hydrogen ion concentrations. Since the former workers were in the habit of comparing the effects of

[1] Address delivered before the Harvey Society, October 16, 1920. The writer's experiments, on which this address is based, have appeared in the *J. Gen. Physiol.*, 1918–19, I., 39, 237, 363, 483, 559; 1919–20, II., 87; 1920–21, III., 85.