SCIENCE

FRIDAY, MAY 6, 1921

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 EQUILIBRIUM FUNCTIONS OF THE INTERNAL EAR[1]

IN this paper I have not attempted to survey the whole range of present-day problems on the functions of the labyrinth but have confined myself to some phases of two fundamental questions. (1) What and how much differentiation of function can be proved to exist in the different labryinthine structures concerned in equilibrium? (2) How does movement or change of position of the body give rise to the excitation process in the labyrinth?

I wish to state at the outset that merely for the sake of brevity specific mention will not be made of the reasons for assigning the functions discussed to the inner ear rather than to the movement of retinal images or to other sources of sensory stimuli, but must have it understood that those possible errors have not been left uncontrolled. Furthermore I have dealt with the phenomena objectively, because the experimental work which can throw light on these questions has necessarily been done upon animals in which the postulation of subjective sensations is unsafe or unnecessary. Furthermore I have not been unmindful of the fact that the reactions in the form of compensatory movements and forced positions include the simultaneous activity of many muscle groups, but I have used the compensatory movements of the eyes as the most convenient index of the labyrinthine reflexes, and also as the simplest to describe.

The labyrinth of the higher vertebrates must be used in the solution of many yet unsolved problems, but for the two fundamental questions now before us it presents insuperable difficulties. On the other hand the ears

[1] Read before a joint session of the American Society of Naturalists and American Society of Zoologists, December 30, 1920.