

and Sir Robert Ball, writing in 1900:

"That the earth's beginning has been substantially in accordance with the great Nebular Theory is, I believe, now very generally admitted."

But many modifications of the hypothesis, and not a few theories that reject it, have been offered.

Chamberlin, the distinguished geologist, and Moulton, to whom reference has already been made, reflecting on the difficulties standing in the way of Laplace's theory, struck by the fact that the spiral nebulae constitute by far the most numerous class of nebulae, considering also certain geological demands, proposed quite a new theory. A sun passing near to a second sun excites in it, through attraction, an extraordinary tidal condition. Great protuberances on each side, in the direction of the disturbing sun ensue. Parts of those protuberances revolving in train about the parent sun condense and attract to them the smaller cooled parts of the protuberances that are to hand, as well as such other matter as may be gathered in from the space through which the system is passing. The disturbed sun in its early career presents the appearance of the spiral nebula. This theory has met with a large measure of approval rather than acceptance. Connected with it are serious difficulties. Thus, Hale pertinently asks "How can these small bodies—the projected matter from the sun—remain brilliantly luminous for many years? and, why do we not discover incipient spirals giving a bright spectrum?" If it be answered that large and small are merely relative, then may we not say with Ball, conjecturally, that the spiral nebulae,—vast as under any consideration they must be—may be of an order quite different from what we have supposed, generators not of a stellar but of a galactic system.

Quite recently there has appeared the second volume of the great work of See, on the "Evolution of Stellar Systems." The author points out numerous objections to the theory of Chamberlin and Moulton, insisting that if the theory were true we should have the following consequences:

- (1) Spiral nebulae would be abundant where the stars are