

3.
Impossi-
bility of pre-
diction.

recent times, owing to improvements in the microscope, the existence of organisms without nuclei has become doubtful. To complicate matters still more, to the nucleus have been added the nucleolus, the vacuoles, the central or pole corpuscles of the cell, &c. It is quite evident from this short reference to the changes which the definition of the morphological unit of living matter has undergone, that no complete and accurate description lending itself to measurement and calculation could be based upon it. The conception, useful as it may be, has therefore not permitted of predictions, such as mechanical, physical, and even chemical science, abound in. "Has one ever," says Delage, "in a single instance divined in advance the least of those structures which the microscope has unveiled? Has one divined the transverse striation of muscles, the cilia of vibratile epithelia, the prolongations of nerve-cells, the action of the retina or the arcades of Corti, the chromosomes of the nucleus, the centrosome of the cytoplasm?"¹ Or, to take an example not from the morphology but from the physiology of organic cellular bodies. It is a very general and a very useful property of cells that they readily absorb substances; in fact, this property is one of the most valuable aids in microscopic exam-

¹ 'L'Hérédité,' &c., p. 746. Prof. Weismann, in his celebrated 'Essays upon Heredity' (Engl. transl. by Poulton, &c., p. 255), claims for the theory of descent that "it has rendered possible the prediction of facts, not indeed with the absolute certainty of calculation, but still with a high degree of probability. It has been predicted that man, who, in the adult state,

only possesses twelve pairs of ribs, would be found to have thirteen or fourteen in the embryonic state; it has been predicted that, at this early period of his existence, he would possess the insignificant remnant of a very small bone in the wrist, the so-called *os centrale*, which must have existed in the adult condition of his extremely remote ancestors."