

supposes the fact of heredity—that is, the transmission of characters peculiar to the parents (be they acquired by them or not), and the fact of variation, but it does not explain them. It does not give any intelligible description of the means which nature uses to secure that continuity of change which is marked on the one side by a faithfulness to certain typical forms, and on the other by a gradual development. The cellular theory permits us to comprise, under the general categories of cell-growth, cell-division, and cell-fusion, the great facts of the history of all living matter, but it does not explain how that apparent sameness of structure which the ultimate morphological unit, the cell, presents to our view, develops into that variety of recurrent forms which make up the wealth and the order in the world of natural objects. The older naturalists were divided into two distinct schools: one believed in pre-formation with development—the older meaning of “evolution”; the other in after-formation, or “epigenesis.” The former foundered on the difficulty of explaining or making plausible how all the germs of hundreds of succeeding generations could be contained in the first ancestor; the latter failed to explain how nature was able to build up by mechanical forces out of unorganised matter a structure resembling the parent structures. The suggestion of a “*nisus formativus*,” which we owe to the celebrated Blumenbach, is only a definition of the difficulty, not an explanation.

The three distinct ideas represented by these historic terms occur again in modern biology, though altered to suit the vast extension of actual knowledge of facts, and