

(Metazoa and Metaphyta). In short, all plants and animals have a cellular structure.

(2) *Embryological*. Every organism, reproduced in the ordinary way, begins its life as a single cell. The simplest organisms rarely get beyond this stage; almost all remain strictly unicellular. But in all other cases the original single cell in which the individual life begins—the fertilized ovum—divides and redivides into a coherent mass of cells, and gradually gives rise to a more or less complex body.

(3) *Physiological*. The functions of a multicellular organism are expressible in terms of the activities of its component cells. "Each cell", Schleiden said, "leads a double life: an independent one, pertaining to its own development alone; and another incidental, in so far as it has become an integral part of a plant" (1838). "The whole organism", Schwann said, "subsists only by means of the reciprocal action of the single elementary parts" (1839). "Every animal", Virchow said, "appears as a sum of vital units, each one of which bears with it the characteristics of life" (1858).

These three conclusions combine in impressing us with the unity of organic nature, for although a plant-cell is often very different from an animal-cell, and one animal- or vegetable-cell may be very different from another in the same or in another body, yet the points of agreement in structure, in development, and in function are at least as striking as the observable differences, and often more striking.

Before the cell-theory could attain to the dominant influence which it has exerted for half a century on biology, it required to be cor-
roborated in various directions.

Corrobor-
ation of the
Cell-theory.

It had been recognized that the ovum was a single cell, and the spermatozoon likewise; as early as 1824 Prevost and Dumas had studied the cleavage of the fertilized ovum; it remained to follow the segmentation-cells on to their final differentiation into tissues. At early dates strong steps on this line of research were taken by Reichert (1840), Henle (1841), Remak (1841-1852), and Kölliker (1843-1846).