

the tide of research and the spray of controversy. The little word cell, one of the least fortunate of scientific terms, which once seemed to express a simple fact, has now to cover a perplexingly intricate microcosm. We cannot do more here than make an outline-map of the territory.

The cell is a structural unit or unit-area,—a unified living corpuscle of complex substances. Within this unit it is convenient to distinguish certain parts. (*a*) The general cell-substance or cytoplasm has a complex structure, and consists in part of living matter (protoplasm), in part of obviously lifeless inclusions (metaplasm). (*b*) Within the cytoplasm is the nucleus, again a little world, with readily stainable chromatin substances, and illusive unstainable achromatin. (*c*) In at least a large number of animal cells, especially when they are about to divide, two small bodies known as centrosomes are demonstrable, each surrounded by a sort of halo of delicate rays—the astrosphere. (*d*) In most plant cells there is a very definite cell-wall round each unit, and this is often traversed by distinct intercellular bridges of protoplasm which link cell to cell. In the animal cell the wall is usually much less definite, but the intercellular bridges are very common.

Only a few cells grow to a relatively large size, such as the giant Gregarine, parasitic in the Lobster, which may measure three quarters of an inch in length. Such cases are rare, and most cells remain microscopic. The process of cell-division is thus of fundamental interest, since it is the general mode of organic growth. By absorbing food and water a cell increases in size, and thus contributes to the increased size of the organism, but the cell's increase has usually narrow limits, therefore the growth of the organism necessitates cell-division. The brain of man and higher animals is a noteworthy exception, inasmuch as the nerve-cells do not divide after birth (except in very rare cases of injury).

There are two chief modes of cell-division, technically known as direct and indirect, or amitotic and mitotic. The former is much the less frequent, and much the less