

mise; (*b*) the ciliated Infusorians, which are usually smaller, express a relative predominance of active expenditure; and (*c*) the encysted parasitic Sporozoa represent an extreme of sluggish passivity.

The conception is of value as an attempt to get below the final results of selection to the fundamental possibilities of form and function which supplied the raw material for adaptation.

To the earlier observers, from Dujardin and Von Mohl to Virchow and Max Schultze, the cell-substance appeared to be a homogeneous, viscid substance, including, indeed, granules and vacuoles, but still essentially structureless.

This was a natural view with the means and methods then available. But if modern work has made anything certain, it is that the cell-substance has a complex structure essentially different from that of a homogeneous substance like white of egg. This conclusion has been arrived at partly (and most securely) by observation of living cells with highly perfected (apochromatic) lenses, partly (and less securely) by using fixing reagents which kill instantaneously, and stains which differentiate part from part.

One of the first to maintain that the cell must have a more complex structure than was usually supposed was Brücke, who, in 1861, advanced a hypothesis of minute units intermediate between the molecule and the cell, an idea which has been frequently re-expressed since that date.

From Brücke, as starting-point, we might trace, through Cienkowsky, Hanstein, and others, the gradual growth of the conviction that the physical basis of life is essentially complex in structure. It is enough, however, to note that it soon began to be recognized that the cell-substance consisted of a relatively stable framework (spongioplasm, reticulum, &c.), and a more liquid or labile ground-substance (enchylema, cytolymph, &c.). Some, like Leydig and Schäfer, maintained the greater vital importance of the ground-substance, while the majority emphasized the claims of the framework—a question still beyond solution.