

original cell had the qualities *abcxyz*, it is supposed that its two daughter-cells might have the qualities *abcxy* and *abcxz*. And what each cell becomes, is from the first determined by the particular contingent of vital qualities with which it starts.

According to the anti-mosaic theory, cell-division is *quantitative*, *i.e.* without any sifting out of vital units, and the cause of differentiation is to be found in the varied relations in which the cells find themselves. The prospective value of embryonic cells, Driesch says, is "a function of their location". Each of the early cells is supposed to have a complete set of specific characteristics, but some remain latent while others become active, this being determined by the relations of the particular cell to the whole of which it forms a part.

These two theories, over which a long-drawn-out battle has been fought, agree in recognizing a complex organization in the ovum. Although we cannot see it, or even imagine it, there must be in the egg a complex architectural arrangement of some sort, corresponding to the hereditary qualities. The two theories differ as to the manner in which differentiation occurs, the first relying on the hypothesis of qualitative division, the second on the hypothesis of cellular interaction.

The two most serious objections to the mosaic theory are: (1) that there is no proof forthcoming of qualitative cell-division; and (2) that an isolated cell from the 2-cell or 4-cell stage of a developing ovum may, in many cases (lancelet, sea-urchin, &c.), give rise to an entire embryo.

The most serious objections to the anti-mosaic theory are found in those cases where even the first cleavage of the egg results in two unequal cells, as in *Nereis*, the reason for this being some unknown predetermination within the ovum.

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