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THE SIGNIFICANCE OF THE INTERNAL RETICULAR APPARATUS OF GOLGI IN CELLULAR PHYSIOLOGY[1]

IT is natural for us to attempt to reduce physiological activities to a cellular basis. The cells of which we are composed are in a very real sense vital units. Some of them continue to survive many hours after death, and, while we live, many of them are continually dying. But we ought not be disappointed if examination under very high powers of the microscope fails to reveal any definite structural groundwork in the cytoplasm. That it is not homogeneous, as it often appears to be, does not require proof, for chemical and physical homogeneity would be inconsistent with physiological activity. We must have some faith in things unseen; we must extend our conceptions to include the morphology of the ultramicroscopic and invisible; otherwise we fail.

Like a great factory, the cytoplasm must be spacially organized for the separation and integration of chemical reactions. Industries are coordinated through trade; the cells by the blood stream. But the cell is many times more efficient than any factory. Within its small compass it rapidly brings about chemical changes which are only possible outside the body at high temperature and with the aid of much complicated machinery. It is marvelously well regulated and works with wonderful harmony. The analogy is, of course, hopelessly inadequate, but it is nevertheless useful for our purpose. As in a factory, certain areas of the cytoplasm are set apart to perform specific duties. I have in mind, for example, the contractile portion of the muscle cell and the secretory pole of the gland cell. The most recently recognized area and the one about which we know the least appears in many cases to be of fluid nature. It has been called the Golgi apparatus after its discoverer, but the term "apparatus" is unfortunate because it suggests a mechanism of a rather inanimate type. With the dawn of an era of experimentation in technique, much attention is being paid to this portion of the cytoplasm. Already the literature has become so unwieldy that to save valuable time we gladly avail ourselves of carefully constructed reviews, like those of Duesberg, Cajal and Pappenheimer, to determine what has or has not

[1] Eighth Harvey Lecture delivered at the Academy of Medicine, New York, March 19, 1923.