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THE PHYSICAL BASIS OF LIFE¹

I HAVE been much honored by the invitation to speak on this occasion, but for me it has meant more; for the man in whose memory the Sedgwick Memorial Lectureship has been established was my life-long and cherished friend. My theme to-day is drawn from an infinitesimal but all-including world, bounded by the horizon of the compound microscope, a world that may seem far distant from Sedgwick's own broad domain of sanitary science and the public health. I am sure, however, that such would not have been his own view; for Sedgwick was one of the pioneer teachers of general biology in this country, and it was his life-long habit to think of the phenomena of life in terms of the activities of protoplasm.

I have a lively recollection of how he and I, in the days of our youth, when fellow students at Yale, fell under the spell of Huxley's Edinburgh address on the "Physical basis of life," at that time still a subject of widespread popular discussion. In this celebrated discourse, delivered in 1868, the eminent English biologist set forth certain general conclusions concerning protoplasm which had gradually taken shape through the work of such investigators as De Bary, Max Schultze, Kühne, Brücke and Lionel Beale. Huxley's presentation of the subject was a masterpiece, both of English style and of philosophical breadth of outlook. In part for this reason, still more because of its supposed materialistic implications, it aroused immediate and widespread public attention. Huxley himself warned that to accept his conclusions would be "to place one's foot on the first rung of a ladder which in most people's estimation is the reverse of Jacob's and leads to the antipodes of heaven"; nevertheless, he insisted that

¹ The first Sedgwick Memorial Lecture, delivered in Boston, December 29, 1922. It will hereafter be published in fuller form, with illustrations, under the auspices of the Department of Biology and Public Health, Massachusetts Institute of Technology.

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