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THE RELATION OF BIOLOGY TO PHYSICS[1]

IT came to me as a great surprise that a biologist should be invited to give an address at the dedication of a physical laboratory. I realized my unworthiness to represent the many sides of biology on such a significant occasion, but I dared not decline on these grounds, because there are certain things that I want to say, and your invitation gives me a chance to say them.

First of all, I should like to point out that one of the most important developments in recent times is the recognition of the need in the biological sciences of workers trained in physics. It seems to me that the reverse is also true—that a biologist is needed in physical laboratories. Perhaps to-day is the first time that this has been recognized, and Vassar has been foremost to recognize this fact, even though the biologist is allowed to remain for only one short hour.

When we dedicate a new building to *biology* at Columbia I shall see to it that one of your physicists is invited to respond to the sentiment, "the relation of physics to biology." As there is no immediate prospect of this building there will be several years to think it over.

If the president of Vassar or the program committee or whoever arranged these dedication exercises had intended that the speaker to-day should analyze the relation of *physiology* to physics, he or they, I am sure, would have picked out a physiologist. The physiologist would have had an easy and even a delightful time, for physiology has long since been wedded both to physics and to chemistry. A modern physiological laboratory is scarcely to be distinguished from a physical laboratory, having borrowed its instruments, at least, from the former.

There is, however, another side of biology that is conspicuous by its absence from most physiological laboratories. The traditional physiology of the schools is interested in the functioning of the organs. It takes the *organism* for granted and tries to find out how its organs work in health and in disease. The close relation of functional physiology to medicine explains and justifies this limitation of its field of interests.

[1] One of a series of addresses given at the inauguration of the new physical laboratory at Vassar College in October, 1926.