



Lafayette B. Mendel

Companion in Research

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THE Symposium "Nutrition and Metabolism in Mental Disease" is being presented in memory of Lafayette B. Mendel, and it is my pleasant assignment to tell you something about this man. I have used the title "Companion in Research" to indicate the wholly delightful relationship experienced by those of us who had the privilege of working with him. Academically, Dr. Mendel was well known as Professor of Physiological Chemistry at Yale University. For more than forty years he was a member of the faculty there, and during the last fourteen of these years he held one of the Sterling Professorships. For most of his active career he was also a Research Associate of the Connecticut Agricultural Experiment Station, a position which played an important part in his investigative activity.

Dr. Mendel was an honor student in the Yale class of 1891, and his studies included the classics as well as biology and chemistry. After teaching and doing graduate work with Chittenden, he received the PH.D. degree in 1893 and departed for Europe to study with Heidenheim and Röhmman in Breslau and with E. Baumann in Freiburg. During this time his outlook expanded both culturally and scientifically and, as he later said, his subsequent interest and activities in scientific work were greatly influenced. On his return to Yale in 1896 he was appointed Assistant Professor.

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This began a period of teaching and research activity which, with few interruptions, lasted for thirty-eight years.

Physiologic problems attracted Dr. Mendel's attention early, and he participated in a series of investigations on the chemical aspects of digestion and the mechanisms of absorption, at first with Chittenden but later in collaboration with his students. In the early years of this century his interest turned toward enzyme reactions, the pathway of excretion of inorganic elements and the intermediary metabolism of purines. This latter interest led him to undertake an extended investigation of the chemistry of embryonic tissue which, in turn, elicited his attention to the physiologic chemistry of muscle extractives. Although this period of Mendel's work seems to have been aimed toward the establishment of a "biochemical background" there were occasional contributions which indicated his growing interest in nutritional biochemistry.

One of the celebrated collaborations in the scientific history of our time began in 1909 when Dr. Mendel and Dr. T. B. Osborne, Research Chemist at the Connecticut Agricultural Experiment Station, decided to pool their research efforts. Dr. Osborne already was recognized as one of the foremost authorities on the analysis of proteins. On the basis of certain suggestions recorded in the literature, Mendel suspected that, despite the universal attention given to the nutritive significance of the *amount* of protein in the diet, the amino acid make-up of the protein was an important factor in its dietary adequacy. Osborne and Mendel believed that only with a simplified experimental ration composed of known purified food substances could definitive

conclusions be drawn regarding indispensable dietary factors. After perfecting their experimental feeding technic, they carried out an extensive study of the place of protein in nutrition, i.e., the inadequacy of certain plant proteins and the possibility of supplementing these with certain amino acids, the minimum quantity of protein needed for growth and an approach to ascertain the minimum daily allowance of certain amino acids needed for growth and maintenance. Once the protein requirements were established, other aspects of the diet were examined.

The nutritional requirement for various minerals during growth was examined and, as an outgrowth of these studies, Osborne and Mendel added valuable corroborative evidence to the theory that a water-soluble vitamin existed in milk. From their investigation of the fat requirement in the diet, they discovered vitamin A and the nature of some of the metaplastic tissue changes resulting from the lack of this food factor. These and many related investigations led to the conviction that growth, long retarded by the lack of a dietary essential, could be resumed at any age once the nutritive environment again became adequate; this was a new concept at the time. The scientific collaboration between Osborne and Mendel was terminated by Osborne's death in 1929. It was an exceedingly fruitful effort; the publications alone averaged eight per year between 1911 and 1927.

During this period Dr. Mendel also carried out studies on a wide range of topics with graduate students in his own laboratory. The metabolism of pyrimidines; nonspecific protein reactions; regulation of blood volume; carbohydrate metabolism; calcium and magnesium metabolism; the physiology of absorption, transportation and secretion; and various studies on vitamins were some of the subjects coming under his keen scrutiny. The relation of food fat to the composition of body fat was one of the last problems extensively studied by Dr. Mendel. The fact that for so many years he was able to supervise the research work of a large number of graduate students, to help guide the extensive program at the Experimental Station and at the same

time to carry a reasonably heavy teaching schedule, indicates his capacity for organization and for efficiency in his habits of work.

Dr. Mendel's fundamental contributions to the field of nutritional biochemistry were made in the first third of the present century, a period when physical chemistry was just beginning to be recognized as a potent factor in biologic concepts and in analytic methods. He frequently said, "Give me a method and I will give you a problem," indicating by this aphorism that many functional problems well known to him awaited better analytic procedures for their solution. Dr. Mendel frequently called attention to the possibility of elucidating biochemical mechanisms from the point of view of physical chemistry, a circumstance which leads me to believe that, were he active today, he would be in the forefront of progress in his field.

Dr. Mendel had an unusually broad acquaintance with the scientific literature of the time in his fields of interest and wrote fluently and cogently. He was the author of many reviews dealing with nutrition and the chemical aspects of growth and had three books published. A prolific contributor to scientific journals and an established investigator, Mendel early became active in editorial matters: he insisted that expository English can be elegant as well as informative and always kept the practical problems of the publisher in mind. He had a part in the establishment of several of our standard journals and served as editor as well. Dr. Mendel was an effective writer for the layman and believed in the need for accurate popular scientific writing.

Dr. Mendel was one of the great teachers of his time and is affectionately remembered by his students. He elicited their curiosity and aroused their interest, not only in physiologic chemistry itself but also in its application in medicine and public health. Dr. Mendel was pragmatic in his outlook and it seems that therein lay his ready appeal to young men; he began to attract graduate students early in his career. Once the problem to be solved was selected from several suggested by the Professor, the student began to feel the influence of Mendel's own enthusiasm in the



project; he early found himself gently but deftly guided through the intricacies of technic, often by the Professor's own hand; gradually he became aware of a developing maturity in his scientific philosophy; and finally he was made to feel a deep and abiding fellowship with the scholarly host who unselfishly searched for truth. Training for a research career with Dr. Mendel was more than an emphasis on the principles of research; it was, in addition, an endowment with a benign but liberal independence of thought.

I do not know that Dr. Mendel ever had a "course" in education in college, but he evolved his own effective methods of exploiting the material under discussion. According to him, most things are possible for the mind prepared by the accumulation of facts although the method of accumulation is not the same for all students. Free interchange of ideas between the research workers in his laboratory was a favored method of learning by precept, and the younger students considered it a privilege to act as apprentices to the more mature investigators. Many of the numerous research fellows and graduate students from Dr. Mendel's laboratory have gone forth to pro-

ductive careers in teaching and research; all of them think back with abiding respect and affection to the man who made it so pleasant to learn.

Dr. Mendel frequently pointed out that "those who can and will" are never idle. His down-to-earth approach to a situation and his objective critique fitted him for the manifold committees and permanent boards in the University of which he was a member throughout his career. A fluent speaker to both professional and lay groups, he was in constant demand for such activity. He lectured on many research foundations and served as advisor to government groups and to national research projects. He looked upon his extensive public service as a pleasant obligation of his distinguished position in our national science.

Dr. Mendel enjoyed many honors during his lifetime as befits an outstanding figure in academic and scientific fields. The posthumous honor to his memory afforded by this Symposium is peculiarly fitting, it seems to me, for it exemplifies both his practical approach to scientific problems and also his deep concern for human welfare.

