of quantity—including factors that interfere with quantity production, like plant diseases and insects. It would be no revolutionary step for us to think in terms of *nutritional* quality as well. We have demonstrated that we have the personnel, the training, the facilities and the equipment to make some very significant contributions. We agricultural scientists have felt a strong responsibility for quantity production in the United States. Surely it is just as much our responsibility to further the production of foods of the highest *nutritional* quality—in other words, to dovetail agricultural production with human physiological needs; to move toward the ideal of a better nourished nation.

I shall not attempt here to suggest exactly where such lines of research would lead. But I am sure that one of the most fundamental steps would be a thorough study of our soils from the standpoint of their suitability or unsuitability for the production of certain foods —including the possibility of amending them, if it can and should be done, so that they will give the people who live on them, not just so many pounds of food, but all the complex and subtly balanced nutrients we human beings need. Certainly by this means, general health will be improved and there should be little if any need for adding supplements to the daily diet, except temporarily in certain cases.

It may also mean, among other things, that after thorough surveys and investigations certain soil areas may be found inefficient and undesirable for the production of food, although possibly suitable for the production of crops for certain industrial uses or for forests, parks or recreational centers. It may mean that only certain crops should be grown in certain areas or that it will be necessary to add small quantities of essential but deficient elements in a routine way through fertilizers, irrigation water or sprays to the soil or plants in some areas, so that the people dependent upon the crops in such areas will, automatically and perhaps unknowingly in most cases, have food of high *nutritional* quality. Any foods shipped from such areas would be equally valuable to consumers everywhere.

My thought can be very simply stated. Human well-being is the drive-wheel of agricultural research and this is basic to a prosperous and efficient nation. Here in this realm of nutrition we can get valuable new insights into the true meaning of our work from the standpoint of human well-being. And with new insights will come new objectives.

OBITUARY

JOHN HENRY SCHAFFNER

THE passing of Professor Schaffner from active work in the field of botany means more than the usual sadness experienced in the loss of a friend. He contributed notable papers in a prodigious number and trained a number of prominent botanists who now occupy responsible positions in several of our leading colleges and universities. There are two outstanding traits of character that all who were fortunate enough to know him have commented on—his everlastingly great patience in attempting to solve a problem or to offer explanations to questions and his ability to discover and relate in simple terms many of the problems on which his mind was constantly at work.

In a sense an era has passed with Professor Schaffner. He could be at once a pioneer in the field of cytology, in which his early observations of the reduction division in plants helped establish the firm foundation on which Mendelism now rests, and also to a striking degree a pioneer in the controversy over sex inheritance. He approached this problem in a most unbiased manner, beginning with definitions of primary and secondary sexual states. Even when many geneticists were turning toward a rather rigid Mendelian scheme of sex inheritance, he began gathering the evidence that certain restricted organisms were not safe for the purpose of basing general conclusions on sex inheritance. As a result, his papers threw the whole field open to wider experimentation and to the formulation of broader and more fundamental concepts.

His work in the field of taxonomy also pioneered in the rearrangement according to a phylogenetic system. His system proceeded from morphological studies. It, however, was confirmed in a large measure by serological studies carried out by Metz and his coworkers.

Probably the most patience-trying of his works were those dealing with the problem of sex-reversals and rejuvenation. He succeeded in obtaining four separate rejuvenations in a plant which normally dies after flowering. The spectacular success in this work did not change his habits of work nor cause him to delve as a specialist might into this field to the exclusion of all others.

This leads to the second great trait of his character. All ideas were grist for his mill, to be specifically weighed and tested. It was the simplicity with which he approached each problem that led to his solutions. His observation of minute details often led specialists in certain fields of plant identification to exclaim with surprise at his grasp of a subject. He had a marvelous memory, but his keenness of observation led to his dis-

tinguishing false and true leads with surprising facility. This was equally true in the diagnosis of plant specimens and in observation of plant behavior.

It was not surprising to find him at work on several papers at once. As he once remarked to me "When I get tired or have to wait for one thing, there is always another problem ready for me." This sublime faith in his own endeavor never flagged. It is the mark of a mind at once both great and simple.

John Henry Schaffner was born in Agosta, Marion County, Ohio, on July 8, 1866. He was educated at Baker University, Kansas; the University of Michigan, the University of Chicago and the University of Zurich, Switzerland. In 1897, when he went to Ohio State University as assistant in botany, with the late Dr. Kellerman as professor, there were fewer students in the whole university, 1,200 or less, than there are now in the department of botany each year. Professor Schaffner's work on chromosome behavior between 1894 and 1898 pioneered in the field that has now developed so richly in the application of Mendelism. His papers on the prairies reflect knowledge acquired during his boyhood familiarity with plants now long gone in regions where they were native. His papers on *Equisetum* cover a whole range of plant sciences focused on the single small group of plants he loved so well to study. His eleventh paper in a series on determinate evolution is just off the press two months after his death. With reference to man, in his paper, there is this sentence, "It has been estimated, on a conservative basis, that there are over twelve billions (12,000,000,000) of cells in the human brain alone, and it is evident that the self-conscious personality, my ego, controls this amazing mechanism and other billions of cells of the body to a definite purpose while this sentence is being written." It is a remarkable sentence in that it contains one of the few personal references in his entire writings. Yet even this slight reference to himself turns out, as the context of the paragraph reveals, to be a means of stating a concept of chromosome activity. He seldom thought of himself. His vacations, always with his family, were visits to Kansas, but for the sake of his children and Mrs. Schaffner as well as for the purpose of collecting specimens they often reached Kansas by way of Maine or the Pacific Coast.

Ohio was not neglected in the matter of plant records. The catalogue of Ohio plants is as complete and the herbarium records as numerous as in any state record. Half of these have been added during the last two decades. Perhaps it was the devotion to the herbarium which brought on the heart attack, as it was evident to all of us that the climb of three flights of stairs was a severe strain. When space, more cramped of course than the herbarium, was offered in the basement with the assistants volunteering to do the errand running for changes of specimens to be studied, the answer was only a gentle No, that he preferred to be where all the stored specimens were at hand. The irony of this is that in the original plans for the building in 1914 an elevator to the herbarium was included. For lack of funds at the time this was not installed in the building.

Early in his association at Ohio State University he, with the group that numbers Professors Landacre, Herbert Osborn, Raymond Osburn, James Hine, John Bownocker, and others, founded the Biology Club. This grew into the Ohio Academy of Science. Professor Schaffner was the editor for its entire existence of the *Ohio Naturalist,* the predecessor of the *Ohio Journal of Science.* He was also editor of the *Ohio Journal of Science* from 1916 to 1918, its critical first two years. His services to the academy in this respect are unique. He was its president in 1919.

We have lost a wise counsellor and a devoted friend. We can not think of the man without his works, or the deeds without the personality that produced them. A full bibliography of his 330 papers and books will appear in another place. The Torrey Index lacks about a hundred titles of the full citation of his work. As editor, as teacher, as an example of a tireless investigator, he leaves us a rich gift in his memory.

ADOLPH WALLER

THE OHIO STATE UNIVERSITY

ARTHUR E. HILL

IT is with profound sorrow and realization of great loss that we record the death of Arthur E. Hill, who passed away on March 16, at the age of fifty-eight, at his home, 66 Clinton Place, New York City.

It has been the writer's privilege to have been associated with him over a period of thirty-nine years, during which time he has been a fellow student, a teacher and a colleague.

As a student he was always looked up to and respected by other students for his earnestness with regard to matters worth while, for his rectitude of character and with all this, his happy disposition. He graduated from the College of Arts and Pure Science of New York University in 1901. For the college year 1901–02 he held the Inman fellowship in chemistry at New York University and in 1903 was awarded the degree of doctor of philosophy at Freiburg, Germany.

Upon his return to the United States in 1904 he was appointed instructor in chemistry at his alma mater. In 1912 he succeeded Professor Arthur B. Lamb as head of the department of chemistry at New York University, which position he held until 1937.

As a lecturer and teacher he was known for his great clearness of thought and expression. Frequently, old graduates returning to the campus for a day would