

miration and of respect from a mere hundred of the millions of persons who have already benefited from your work. It is only a slight token of the great admiration we all feel for

you as a man; as a scientist; and as a friend.

—NORMAN JOLLIFFE, M.D., Director  
Bureau of Nutrition, New York City

### Tribute to Dr. Robert R. Williams

It is truly a great honor and a rare privilege that has been given to me this evening, to pay tribute to an old friend and fellow worker who has not only accomplished great things in science but whose life and ideals have been a great inspiration to those around him. To know him is not only to admire him but to respect and to love him. There are many men who accomplish great things in research, but it is a rare combination that is found in Bob Williams of research ability, coupled with the determination and drive to follow up his research accomplishments with their application for the lasting benefit of mankind. His life really has consisted of several careers at the same time, but running through it you can see the path which led to the attainment of that rare satisfaction that so few men have the opportunity to experience—that of seeing the results of their work improve the lot of much of mankind.

Dr. Williams was born in Nellore, India, in 1886, the son of a Baptist missionary. It was undoubtedly the experiences of his boyhood in the missionary compound that did much to interest him in assisting the malnourished throughout the world. His ability to see and record accurately, as well as his human touch, are illustrated by his letters, treasured by his family and friends, which were written during his visit to India in 1950. I would like to read you a few sentences from the one he wrote when he revisited his birthplace at Nellore:

“Across the road the big banyan tree of our childhood years is gone; it died only a few months ago and leaves a great bare patch. . . . I stepped the distance off and found the branch of the parent tree could not have been less than 120 feet, probably more nearly 150 feet. I’ve told so many lies about it I wanted

to check up. It could not have been as much as 200 feet without touching both our bungalow and the seminary building. . . .

“Our old garden is still surrounded by a wall 4 feet high but is broken in spots just from age. . . . Now the cactus hedges which used to surround the compound have been killed off by the cochineal bug which the government brought in for that purpose years ago. There is simply no cactus of the once common type with ‘leaves’ the size of a man’s hand in all of south India. This is a great blessing as cactus was spreading everywhere and formed a great cover for the pest of cobras as we all remember how we used to see them by the dozen in the hedges. However, the loss of the cactus helps permit cattle, buffaloes and goats to wander over the compound and people, vehicles, etc., have made traffic lanes across it. . . . On this account, i.e., the cattle, the baptismal tank or pond north of the compound has been almost abandoned. By the way, I used to think of the tank (as all artificial ponds are called) as being miles from our bungalow but it is really not more than a half mile or so.”

Dr. Williams’ family brought him back to the United States when he was 10 years old, but as soon as he got his degree in chemistry from the University of Chicago he returned to the Orient by accepting a position in the Philippines where he came in contact with Dr. Edward B. Vedder of the U. S. Army Medical Corps. Vedder was much interested in beriberi and by substituting unpolished for polished rice eliminated beriberi from the Philippine scouts. Williams, working at the Philippine Bureau of Science from 1908 to 1912, tackled with Vedder the problem of the chemical identification of the factor in rice polishings which accounted for the relief of



beriberi. Williams quickly and without too much difficulty made concentrates from rice polishings which in small doses he saw relieve the severe symptoms of beriberi in infants. Thus he was started on the problem which he never gave up until he solved it more than 20 years later. It is of interest to note that his first paper from the Philippines, published in 1911, is entitled "Economic Possibilities of Mangrove Swamps," and the second, published in 1912, is entitled "Contribution to the Etiology of Beriberi," a really prophetic title which he could have continued to use for his entire career.

He returned to the United States in 1915 for work with the Department of Agriculture in Washington, where he continued to work on the problem until World War I carried him off into the Chemical Warfare Service, where he worked on lewisite and "dope" for airplane wings. In 1919 he began his work on developing better insulation for submarine cables and he soon developed an improved rubber insulation; this work led him into textiles, paper, paper condensers, lead covered cables, textile insulated wires, decay problems in telephone poles, and so many problems of value to the telephone business that by 1925 he was appointed chemical director of the Bell Telephone Laboratories. The successes he attained in this field and the load of work that he carried would have more than filled the time and absorbed all of the energies of most men, but Williams still had in his mind what it would mean to the world if he could only determine what it was in rice polishings that cured beriberi. So while he spent full time on the chemical problems of the telephone industry, all of his spare time went into chasing the elusive substance in rice polishings. For working space he converted his garage at home into a laboratory and filled it with pigeons for testing his concentrates. He obtained or made his own apparatus and spent all of his spare money, as well as his spare time. In 1925, the year he was made chemical director of the Bell Telephone Laboratories, he was also made a research associate in Teachers College of Columbia University, and here he was able to secure laboratory space and equip-

ment and to gather around him a group of associates so that the problem could be pursued more vigorously and on an expanded scale. By 1933 an efficient method of isolating the vitamin had been finally worked out and he was able to obtain about 5 grams of vitamin from a ton of rice polishings. (It is interesting to note that in 1954 production in the United States was 244,760 lb.) Now they were faced with the problem of isolating the vitamin in quantity so that they could determine its chemical structure. The results were published in a series of now classical papers—19 in number—extending from 1935 to 1937, in which the various vitamin fragments are identified, its chemical structure determined, and its synthesis accomplished. At last the problem was solved over a span of 26 years from that first paper in 1911, and one might again say that here is an accomplishment of which any scientist could well be content—but not this man Williams. Because of his years with industry he was well aware of the need for patents in order to protect an invention and to ensure its proper development and use. He therefore patented each of the steps in his work and then persuaded his associates that they should not profit from this discovery which should be used to the fullest for human welfare.

The Research Corporation had been founded by Frederick Gardner Cottrell to meet just this situation and Williams turned the thiamine patents over to them, establishing the Williams-Waterman Fund in 1935 under an agreement by which two-thirds of the royalties are allocated to the Williams-Waterman Fund for the Combat of Dietary Diseases and one-third to the general funds of Research Corporation for the support of its regular grants program.

What this generous gift has meant is shown by the fact that since 1935 it has produced \$6,145,000, with over \$4,000,000 going to the Williams-Waterman Fund and \$2,000,000 to general funds, while the price of thiamine has decreased from \$7.98 a gram in 1936 to its present price of six cents a gram.

Now that the laboratory research problem was finished, Dr. Williams energetically under-



took to see not only that the royalties went to support more research in nutrition, but also by his personal efforts to see that neither time nor opportunity was lost in making the benefits of a plentiful supply of this essential nutrient widely available. He became a member of the Food and Nutrition Board of the National Research Council and chairman of its Committee on Cereals, a post he has held since 1940. He played a leading role in furthering the enrichment of bread in the United States. Finally, in 1946, he retired from the Bell Telephone Laboratories in order to give his full time to his nutrition work. Having assisted in and seen the health benefits of the enrichment of bread, flour, and corn meal in the United States, he carried his initiative and support back to the Philippines where he had first tackled the problem so many years before, and we find him supporting the studies which demonstrated the value of adding thiamine to white rice by assisting Dr. Salcedo and his group in showing that beriberi can be eradicated by this procedure. As a result, we can see the Philippines taking the leadership in Asia by enacting a law requiring the enrichment of white rice—a measure which, if enforced and extended to the large rice-eating areas of the world, could become one of the greatest contributions to health that the world has ever seen.

I would like to read you a few sentences from a letter which Dr. Salcedo wrote last month:

“Please extend my very best wishes for continued good health and more success to Dr. R. R. Williams at the ceremonies on . . . April 23rd. I wish I could be present even only to shake his hand and express to him my personal and lasting gratitude for everything he has done to promote the health through good nutrition to our people. Undernourished millions the world over

have benefited by his efforts. Countless co-workers, scientists and friends will always have him nearest to their hearts and uppermost in their minds for generations to come. I shall think of him more fondly . . . during the ensuing years.”

Naturally, many honors have come to Dr. Williams. I will not try to enumerate them. Among numerous medals and citations are seven honorary degrees and they honor the donor in the giving. I am sure he will continue to receive others.

He has just passed his seventieth birthday and relinquished the chairmanship of his Williams-Waterman Fund, and, although he will not work regularly at the job, all of us who know him know that he will never cease to be concerned about the malnourished people of the world and that he will be contributing to their betterment as long as he lives.

It has been one of the great inspirations of my life to have had the opportunity to be associated with Dr. Williams in a small way for many years and to have been guided by his wisdom and experience on many occasions. I know that all of his associates will continue to look to him for advice and to call on him for help with the problems of human malnutrition which we know are so close to his heart.

In conclusion, to my mind Dr. Williams represents the best that religious freedom, intellectual freedom, and political freedom can produce. In the troubled times that we see ahead of us in the world, if this country can continue to produce men of Dr. Williams' caliber we have nothing to fear, and the world will be a better place for us all.

—WILLIAM H. SEBRELL, M.D.  
Former Director,  
National Institute of Health

#### Erratum

In the Letter to the Editor, “The Role of Amino Acids in Kwashiorkor,” *AMERICAN JOURNAL OF CLINICAL NUTRITION* 4: 286, 1956, the sentence on the fifteenth and sixteenth lines from the bottom, second column, should have read: “There was loss of edema, regeneration of serum protein, and healing of skin lesions. . .”