the solar constant of radiation, on account of the small amount of variation from month to month in the atmospheric coefficient of transmission.

Linke adopted the factor

$$T = \frac{\text{Total atmospheric depletion}}{\text{Depletion by pure dry air}}.$$

This factor becomes large in industrial cities, as is shown in the more equable climate of urban than of suburban regions.

Chapter VI treats of the total radiation received on a horizontal surface, directly from the sun and diffusely from the sky, and also from cloud sheets, either transmitted or reflected. This is an important subject, and Ångstrom's treatment of it is given in detail.

In this chapter, "Global radiation" is defined as the total radiation received from the sun, either directly, or diffusely from the sky; and in Fig. 11 are shown typical records, obtained on a day with sunshine, and also on cloudy days.

In chapter VII the radiation from the earth to the sky is considered, which is easily measured during the night hours, but which is taking place at all hours of both day and night, although under certain conditions of cloudiness its intensity becomes very low, or even negative in direction, when a cold surface is covered by warm clouds.

The seven chapters reviewed treat of the subject under consideration from the statistical standpoint. The remaining chapters consider it from the theoretical standpoint, which is quite apart from the treatment here reviewed.

HERBERT H. KIMBALL

VITAMIN B_1 AND ITS USE IN MEDICINE

Vitamin B_1 and Its Use in Medicine. By ROBERT R. WILLIAMS and TOM DOUGLAS SPIES. The Macmillan Company Monographs. The Macmillan Company, 1938.

DEFICIENCY of vitamin B_1 (thiamin) is the cause of beriberi, which, since the dawn of medical history, has been one of the major health problems, as it is to-day, in populations subsisting largely upon polished rice. There is increasing evidence that deficiency of this nutrient occurs in the United States to a degree which impairs the health of a considerable number of people. It is, therefore, one of the most interesting of the food factors which are essential in the diet. Since its existence was first demonstrated by Eijkman, in 1897, thiamin has been investigated by many investigators. The greatest achievement in this field of research was the improvement of the yield of the vitamin by Dr. Williams from rice polishings, so that about an ounce of crystalline material was made available for chemical study. With this material, Dr. Williams and his associates succeeded in determining the structure of the molecule and in following up this knowledge in an astonishingly short time by its synthesis. The synthetic vitamin has now become available at moderate cost in any quantities which may be necessary for the prevention of beriberi and for clinical use.

In Part I of the book, "Vitamin B_1 and Its Use in Medicine," the authors have discussed in a concise way all aspects of thiamin deficiency which may be instructive to medically trained readers, and suggest the clinical conditions in which thiamin deficiency may be suspected. Every clinician should be familiar with the recorded experience with thiamin in therapy, and many will gain by reading this excellent discussion suggestions which they will want to apply in their practice.

Part II is devoted to the fascinating story of the researches which have yielded our present knowledge of the vitamin, its physiological role and its final synthesis.

This book should be read by every biochemist, physiologist and progressive physician. The reader may be assured that he will be entertained and instructed by it.

E. V. MCCOLLUM

THE JOHNS HOPKINS UNIVERSITY

SPECIAL ARTICLES

A FATAL DISEASE OF PIGEONS CAUSED BY THE VIRUS OF THE EASTERN VARIETY OF EQUINE ENCEPHALOMYELITIS

DURING the recent epidemic of equine encephalomyelitis in southeastern Massachusetts, a number of human cases of encephalitis were observed, which were shown by Fothergill, Dingle, Farber and Connerley[1] and by Webster and Wright[2] to have been due to the virus of the Eastern variety of equine encephalomyelitis. As part of our investigation of the human disease, it became of importance to consider the possibility of other host reservoirs of the virus. We were informed by a number of pigeon breeders residing in the area where the horse disease existed that during the period of the equine epidemic they had suffered unusual losses in their flocks both of special breeding stock and of the common, domestic pigeon, the species so numerous in our cities. Indeed, one of these breeders made the interesting observation to us by letter that his "losses of pigeons began to cease as soon as the cold weather set in."

[1] L. D. Fothergill, J. H. Dingle, S. Farber and M. L. Connerley, *New Eng. Jour. Med.*, 219: 411, 1938.

[2] L. T. Webster and F. H. Wright, SCIENCE, 88: 305, 1938.