tion of the ocular epithelia, as diagnosed by microscopic examination of conjunctival smears.[3] Similar observations have been made in this laboratory.

The cases reported by Dr. Kruse were obtained from a low-income group of which a dietary survey was being made. In such a group multiple dietary deficiencies are the rule rather than the exception. Therefore, it is important that further investigation of conjunctival and corneal changes be made on subjects with uncomplicated experimental vitamin A deficiency before complete reliance is placed in the biomicroscopic examination as a routine method of detecting mild cases of vitamin A avitaminosis.

ELIZABETH C. CALLISON
FOODS AND NUTRITION DIVISION,
BUREAU OF HOME ECONOMICS,
U. S. DEPARTMENT OF AGRICULTURE,
BELTSVILLE RESEARCH CENTER,
BELTSVILLE, MD.

SOME FACTORS IN THE NUTRITIONAL DETERMINATION OF HISTORY

IN his paper concerning the social implications of vitamins, Williams[1] suggested that the enjoyment of a more generous supply of thiamin and other vitamins by the Germans than by other peoples of Western Europe might explain the present European situation. Thiamin has also been referred to by others as "the morale vitamin." However, I am inclined to agree with Clendening[2] that the importance of vitamins in national nutrition is being grossly exaggerated. False hopes of simple solutions of nutritional problems appear to be raised by an over-emphasis on the value of vitamins. Indeed, it remains to be seen whether the use of "enriched" foods and vitamin preparations will do much more in the long run than increase the incidence of obesity, diabetes and other disorders promoted by over-nutrition.

The developments in Europe during the past 25 years nevertheless seem to present excellent illustrations of the effects of some nutritional factors, independent of the vitamin supply, on the rise and decline of nations or cultures throughout the ages. That is, a nation or culture can develop only when or where a sufficient supply or surplus of food becomes available. In a society with constructive or progressive tendencies, a sufficiency or surplus of food serves, in part at least, to provide leisure for some to develop the arts. Among even the most primitive arts has been that of catering to the appetite. This art has conspicuously manifested itself in tribal feasts, in the Roman banquets and, in recent Europe, by French cuisine. The Roman banquets probably sealed the fate of the Roman Empire and French food and wine were very likely factors in the fall of France. In short, too much food or an excessive catering to the appetite can wreck an empire just as surely as it can ruin an individual.

On the other hand, seasonal variations in the food supply, periodic famines, wars and more or less fasting under religious influences in the past apparently served to avert an otherwise precipitate decline of some nations or cultures because of the common tendency to self-indulgence in the midst of plenty. Thus, in India and China, a relatively steady state or balance between the supply or use of food and cultural attainment has long been maintained. In the first World War, German resistance cracked partly because of simple undernourishment due to the food blockade and, shortly after that, Russia came close to complete collapse because of famine conditions in that country. However, it does not seem to be sufficiently realized that the outburst of the German spirit since the first World War and the recent stubborn resistance of the Russians to invasion are explainable as physiological and psychological consequences of more liberal food supplies following periods of enforced food restriction or starvation. The observations of Carlson,[3] Kunde,[4] Glaze[5] and McCay[6] indicate that a manifestation of physical and/or mental improvement is to be expected with re-alimentation after periods of fasting or food restriction. Moreover, the results of my personal experience, which involves a total of about 600 days of fasting during the past 33 years and also some observations on others, lead me to believe that the most striking after-effects of fasting or food restriction occur between the ages of about 20 and 35. In the German and Russian experiences, this means in those who are now between about 40 and 60 years of age and therefore in active control.

If the foregoing views are correct, it would seem of more importance in America to guard against the insidious effects of dietetic excesses among the "well-fed" millions than to concentrate on raising the nutritional standards of the extremely poor. In any case, so-called deficiency diseases may often be excess diseases—due to excessive intakes of carbohydrates, fats and/or proteins. I believe that a sufficiently keen appetite is about all that is needed to lead one to choose an adequate diet and that the appetite can best be kept keen by occasional periods of voluntary food restriction or fasting. More studies ought to be made on the after-effects of fasting and simple undernutri-

[3] J. B. Youmans, M. B. Corlette, M. G. Corlette and H. Frank, *Jour. Lab. and Clin. Med.*, 23: 663, 1938.
[1] SCIENCE, 94: 502, November 28, 1941.
[2] *Jour. Am. Med. Assn.*, 117: 1035, 1941.
[3] "The Control of Hunger in Health and Disease." Chicago. 1916.
[4] *Jour. Metabolic Research*, 3: 399, 1923.
[5] *Am. Jour. Psychol.*, 40: 236, 1928.
[6] "Chemical Aspects of Aging." In Cowdry, "Problems of Ageing." Baltimore. 1939.

tion. Undoubtedly, many a conscientious objector to military service would be willing to volunteer for such nutritional study.

FREDERICK HOELZEL
DEPARTMENT OF PHYSIOLOGY,
UNIVERSITY OF CHICAGO
Submitted Dec. 6, 1941.

FALSE BLOSSOM IN PERIWINKLES AND ITS CURE BY HEAT

ONE of the chief difficulties in the study of false blossom has been the lack of a host in which the disease could be reproduced as it occurs in the cranberry which, for various reasons, is not a good experimental plant. Under the stimulus of finding a favorable host in which to observe the efficacy of heat treatments for cure of false blossom, attempts were made to transmit virus from cranberries to periwinkles (*Vinca rosea*). The parasite, *Cuscuta campestris* Yuncker, which had been shown to transmit certain other viruses,[1] was used. It proved to be an efficient vector. Through its parasitic activities, false blossom was taken to periwinkles and also to potato, tomato, tobacco and *Nicotiana glutinosa* plants. Under favorable conditions the disease appeared in periwinkles within about one month after exposure to the parasite. The virus was readily transmitted in all the new hosts by grafting.

False blossom periwinkles were cured easily by heat treatments. Exposures at 40° C for one week cured the tops but not the roots, but exposures for two weeks cured both tops and roots. Diseased periwinkles were able to endure the treatments without serious injury. Whether false blossom can be cured in the cranberry has not yet been determined. Experiments designed to test this possibility are in progress. In its reaction to heat in periwinkles, false blossom virus behaves similarly to that of aster yellows.

L. O. KUNKEL
DEPARTMENT OF ANIMAL AND PLANT PATHOLOGY,
THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH,
PRINCETON, N. J.

SCIENTIFIC BOOKS

SINANTHROPUS PEKINENSIS

The Extremity Bones of Sinanthropus Pekinensis. By FRANZ WEIDENREICH. *Paleontologia Sinica* New Series D. No. 5. 82 pp. 20 tables. 34 plates. Peking, 1941.

THIS latest paper in the long series of studies of the *Sinanthropus* material by Dr. Weidenreich had received only a sparse distribution in the United States before the outbreak of war halted its importation. Because of the tremendous interest attaching to the Choukoutien remains, as well as the inaccessibility of many of the accounts dealing with the material, a summary may be useful.

Unfortunately the Peking calvariae have not been accompanied by a similar abundance of arm or leg bones. So far we possess only seven fragments of femur, two of the humerus, one of the clavicle and one carpal bone: the *os lunatum*. Nevertheless, these remains are such as to permit observations concerning their general evolutionary status.

In the case of the femur, Dr. Weidenreich believes the material justifies the conclusion that *Sinanthropus* was short in stature, approximating the average of the present-day Eskimo or Japanese. The structure of the bone betrays certain distinctive traits. The medullary canal of the shaft is, for example, very narrow and the walls correspondingly thick—much more so than in modern man. Neanderthal femora are more rugged, and the degree of forward bending of the shaft in this latter form is much more pronounced than in the Peking type. In these two respects, *Sinanthropus* approaches *sapiens* more closely than does *neanderthalensis*. All in all, some nine minor characters are noted as more or less distinctive and apparently specific for *Sinanthropus*. Nevertheless, the femur is definitely human in character, and there is no doubt that Peking man walked erect. The proportions, the presence of a linea aspera, and the position of the gluteal tuberosity, are definitive upon this point.

The humerus, also, is of human character. As in the case of the femur, a few minor peculiarities are noticeable. They are, however, features occasionally to be observed in modern man. The humero-femoral index, which expresses the length of the humerus as a percentage of the length of the femur, is indicated at about 79. This falls in the existing human range, whereas in the anthropoids the index ranges well over 100. An index of 79 is thus amply suggestive of the essentially human and upright posture of *Sinanthropus*.

The semi-lunar wrist bone or *os lunatum* is similarly human, though its height-breadth and length-breadth indices are variant in an anthropoidal direction. The clavicle is seemingly more akin to modern man than that of *neanderthalensis*.

There seems no doubt, in view of the above evidence, that Dr. Weidenreich's contention that man had already assumed an erect posture, in other words was a bipedal ground-dwelling primate before his skull and dentition had been so extensively modified in a human direction, is fully acceptable.

[1] Folke Johnson, *Phytopath.*, 31: 649, 1941.