

The Effect of Agricultural Practices on Health and Disease*

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IT IS THE PURPOSE of this paper to correlate some recorded observations, and interpret them, in terms of possible etiology, of the health and some of the ills of man. Minot¹ states: "It has been proved that certain diseases reflect the character of the social and economic as well as the geographic environment." Snapper² indicates that every phase of clinical medicine in Peiping is influenced by the peculiar food situation. One might add that health, too, reflects the character of the social, economic, and geographic environment.

The correct diagnosis and therapy in deficiency diseases has been one of the advances of medicine. However, our desire is the prevention of these deficiency diseases. Although much has been accomplished, there are still many unknown factors in the field of nutrition and its relation to sickness and health.

The medical journals have many papers telling of recently acquired knowledge on almost every variety of deficiency—avitaminosis, hypoproteinaemia, and mineral imbalance, with therapeutic response when therapy is based on the proper rationale. There are perhaps no doctors more aware of the value of rational vitamin, mineral, and food concentrate therapy than we in neuropsychiatry. However, the absence of the progressive degenerative disease of the blood vessels—arteriosclerosis; or the progressive degenerative disease of the nervous system—multiple sclerosis—among the Northern Chinese, whose diet is inadequate in those things we can determine by laboratory analysis; namely, calcium, vitamins, calories, suggests that limited vitamin, mineral, and caloric value is not etiological of these diseases. They have their avitaminoses, their hypocalcemia even to the extent of osteomalacia, but not arteriosclerosis and multiple sclerosis as do their better-fed friends in Continental Europe, England and America. When their food is biologically assayed, who are better off—the Orientals or the Occidentals?

Are the agricultural practices of the Orient and those of Germany, for instance, the reason that multiple sclerosis is unseen in the Orient and so common in Germany? Natural manures have been

used in the Orient for centuries, while chemical fertilizers have been championed by the German school of agriculture since 1840. Is this type of soil fertility a factor in giving a food to the population, which, in turn, tends to give them an immunity to arteriosclerosis, thrombophlebitis, multiple sclerosis, Gaucher's disease, renal calculi and gallstones—an immunity which the Chinese seem to have. Does the Oriental agricultural practice give an x value to food that makes its biological assay high in spite of the Chinese diet being low in chemical assay?

Does it follow that people who have an adequate diet will not have deficiency diseases, and, furthermore, may have better natural immunity to disease? The question that presents itself is—what is an adequate diet? Until the present the emphasis has been on the quantities of vitamins, minerals, proteins, fats, carbohydrates, and not on the quality of foods. We may be instructing our patients to ask the questions—how fresh is this food? From where did this food come? What was the nature of the soil fertility that grew this produce? Were natural manures or commercial fertilizers used on the land? What was the fungus and bacteria growth in the soil that grew this food? Was this vegetable grown on a mycorrhizal or non-mycorrhizal soil? What was the quality of the food fed this veal or that beef?

This question of food quality was brought to my attention by Colonel Henry W. Anderson, a lawyer by profession, a scholar by nature, and an agronomist by avocation, when he told me of his observations and presented me with a recent book, *An Agricultural Testament*, by Sir Albert Howard, C.I.E., M.A., formerly Director of the Institute of Plant Industry, Indore, and Agricultural Advisor in Central India and Rajputana. Sir Albert's discussion of the agricultural practices of the Orient caused me to recall that multiple (or disseminated) sclerosis is practically unknown in Japan and China (Miura, Pfister);³ that there is some question whether one sees genuine pernicious anemia with its severe neurological complications in Northern China;² that, although syphilis is as fre-

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quent as the common cold in Korea, tabes was not once diagnosed by Wilson, who practiced there thirty years;⁴ that there is a remarkable scarcity in China of arteriosclerosis, Gaucher's disease, kidney stones, gallstones and perhaps even thrombophlebitis.² (Snapper)

Is it not possible that Nature has presented us with a great many more pertinent facts in the geographic distribution of disease and health? The reasons for the presence and absence of certain diseases among the population of various parts of the world present a complicated and involved question. These natural experiments that are being made all over the world, due to a multiplicity of local circumstances, customs and habits, or changes forced on a people by war or poverty, make available a wealth of material for study and investigation.

What are some of the natural experiments that present material which we may use as indices of health and disease found here and there? And what are the agricultural practices of these respective locations, which may affect the quality of their food?

Heard⁵ states: "Dental caries is rare in the town of Hereford and the County of Deaf Smith, Texas. . . . After twenty-eight years of interrogating my patients, together with my experience and observation, I am of the opinion that this phenomenon is due to our soil's richness in minerals and vitamins. The growing of plant foods has depleted the soil in most areas of the world of essential mineral elements; and our system of fertilization has failed to restore these elements in adequate quantities." He also comments: "Both physically and mentally this area furnishes superior zoölogical specimens."

McCarrison⁶ records an observation: "My own experience provides an example of a race, unsurpassed in perfection of physique and in freedom from disease in general. . . . I refer to the people of the State of Hunza, situated in the extreme northernmost point of India. Amongst these people the span of life is extraordinarily long; and such service as I was able to render them during some seven years spent in their midst was confined chiefly to the treatment of accidental lesions, the removal of senile cataracts, plastic operations for granular eyelids, or the treatment of maladies wholly unconnected with food supply. Appendicitis, so common in Europe, was unknown. . . . It becomes obvious that the enforced restriction to the unsophisticated foodstuffs of nature is compatible

with long life, continued vigor and perfect physique."

McCarrison⁷ carried out in India some experiments on rats. He mentions first the many different native races of which the population, 350 million, is composed. After describing the experiments he concluded: "What I found in this experiment was that when young growing rats of healthy stock were fed on diets similar to those of people whose physique was good, the physique and health of the rats were good; when they were fed on diets similar to those of people whose physique was bad, the physique and health of the rats were bad; and when they were fed on diets similar to those of people whose physique was middling, the physique and health of the rats were middling."

I would like to mention two observations during World War No. 1—first, Hindhede⁸ states: "In Denmark the people received a sufficiency of potatoes, whole-rye bread (containing wheat bran and 24 per cent of barley-meal), barley porridge, grains, milk, abundance of green vegetables and some butter. In consequence of this enforced alteration in the dietetic habits of the Danish people, the death rate dropped as much as 34 per cent, being as low as 10.4 per cent when the regimen had been in force for one year." Hindhede concludes that "the principal cause of death lies in food and drink." The second observation was by Demoor and Slosse,⁹ who noted: "Despite the food restrictions imposed upon the people of Belgium during the late war, the infant mortality and infantile diarrhea have decreased greatly;" a circumstance, according to this article, which was "due to organized propaganda encouraging mothers to nurse their infants and to the establishment of national canteens which provided prospective mothers, from the fifth month of pregnancy onward, with eggs, milk, meat, and vegetables."

The Local Medical and Panel Committee of Cheshire, England,⁷ representing 600 doctors, reviewed their 25-years experiences, stating: "There has been a fall in fatalities and this was all the more noticeable in view of the rise in sickness. . . . This illness results from a lifetime of wrong nutrition." They point to the high incidence of bad teeth among English children in the British Isles, but this condition does not exist among their cousins on Tristan da Cunha; also, rickets is still common in England, while in Holland it is relatively rare; there butter, milk and cheese are plentiful. They further point to nutritional anemia and defective diet constipation." They go on to say: "It is far from the purpose of this paper to advo-

cate a particular diet." They remark on the health and the diet of the Eskimos and the Hunzans and the English on Tristan de Cunha and say: "There is some principle or quality in these diets which is absent from, or deficient in, the food of our people today . . . to decry some factors common to all of these diets is difficult, and an attempt to do so may be misleading since our knowledge of what those factors are is still far from complete; but this at least may be said—that the food is, for the most part, fresh from its source, little altered by preparation, and complete; and that, in the case of those based on agriculture, the natural cycle:

Animal and Vegetable Waste) — Soil — Plant — Food((Animal—) Man (———)

is complete: no chemicals or substitution stage intervenes."

This committee refers to the work of Sir Albert Howard, stating: "He has shown that the ancient Chinese method of returning to the soil, after treatment, the whole of animal and vegetable refuse which is produced in the activities of a community, results in the health and productivity of crops and of the animals and men who feed thereon."

In this article it is indicated, not only how bad teeth, rickets, anemia and constipation may be helped, but the observations of the family doctors revealed that the nutrition of expectant mothers was closely supervised in a Cheshire village, the diet being raw milk, butter, Cheshire cheese, oatmeal, eggs, broth, salad in abundance, green leaf vegetables, liver and fish weekly, fruit in abundance, meat and whole-meal bread made of two parts of locally grown wheat and one part of raw wheat-germ, the bread being baked within 36 hours after the milling of the flour. It was noted that mothers were usually able to feed their infants. The nursing mother's food continued as in pregnancy. The children were described as splendid, with perfect sets of teeth common; pulmonary diseases were almost unknown; they slept well, and one of their most striking features was their happy personality. The opinion was expressed: "The human material was entirely unselected, the food was not specially grown but that in spite of these imperfections, the practical application of McCarrison's work should yield recognizable results shows that in a single generation improvement of the race can be achieved."

Sir Albert Howard¹⁰ points out: "Soil fertility is the condition which results from the operation

of nature's round, from the orderly revolution of the wheel of life, from the adoption and faithful execution of the first principle of agriculture—there must always be a perfect balance between the processes of growth and the processes of decay. The consequences of this condition are a living soil, abundant crops of good quality, and livestock which possess the bloom of health. The key to a fertile soil and a prosperous agriculture is humus. Humus in the soil affects the plant directly by means of a middle man—fungus—producing the mycorrhizal relationship. Nature has provided an interesting piece of living machinery for joining up fertile soil with the plant."

Does it follow that the agricultural practices of the Orient account for the seeming absence of some of the degenerative diseases that we are more prone to have in America and Europe? Is the produce of our farmers using artificial fertilizer lacking in quality because the chemicals are not sufficient to give food quality? Is there a relationship between food produced on a soil rich in fungus and the absence of susceptibility to diseases of those who live on this food?

In agricultural literature the importance of these fungi in promoting growth and aiding nutrition has been emphasized.¹¹ Dubois (Rockefeller Foundation) cultured from the soil his gramicidin-producing fungus. Would there be anywhere near as much need for gramicidin and penicillin if our food were derived from a humus-rich soil prolific in its fungus growth? Has the Occidental agricultural practice of using commercial fertilizers been inadequate and destroyed the bacteria and fungus in the soil and, in turn, given us an inferior produce that has reduced our natural immunity to infections?

This paper is presented as a preliminary discussion, and the thoughts are merely suggestive. The scientific investigation of the sources of food supply in this country and the after effect upon health and disease, especially, as we have pointed out, degenerative diseases, has not gone far enough to justify definite conclusions. The observations are certainly indicative of possible fact, and stimulate us in our studies of this x quality factor in food. The studies and results of experiments already made by distinguished scientists, some of which have been mentioned, strongly indicate that efforts toward the prevention of diseases, especially of deficiency diseases and diseases of a degenerative character, and the consequent improvement of the health and happiness of the human race, demand a more thorough study of the sources of food supply, the methods of production, and the

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soils from which foods are produced. Nutrition is not a question of quantity only but of quality also.

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