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Michel Pijoan

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FOOD AVAILABILITY AND SOCIAL FUNCTION

Michel Pijoan

WHEN, IN THE spring of 1941, our country first began to mobilize for war, the discovery was made that poor nutritional background was responsible for the rejection of 400,000 out of the first million selectees. The existence of such an appalling situation in a country which presumably has a higher standard of living than any other country in the world, points to a fundamental weakness in our general eating habits. The cause of this deferment of such a high percentage of our manpower on account of malnutrition is to be found in a traditional dietary background high in carbohydrates, rich in sauces and gravies, and markedly deficient in many essential and specific food substances. Until such a time as remedial steps are effectively instituted, the ubiquitous baker stands as a symbol of vitamin deficiency.

Nutritional deficiency such as exists among low-income groups in the state of New Mexico is not due alone to the absence of a single food substance or even to an insufficiency of one of the three main types of food which go to make up a balanced diet. Nor can the resulting deficiency diseases which persist in such a high percentage of all people be permanently cured by the administration of mere palliatives. The situation is much more complex than that. Yet, strangely enough, nutritional deficiency among such groups has common origin; and the story, once grasped, is a simple one.

Nutritional deficiency has come about as the result of a gradual evolution of food habit patterns—and, indeed, of the whole cultural structure of the people—a metamorphosis so subtle that the people themselves are only vaguely conscious of having passed through it. Only by an occasional wistful reference to a remote past when deer meat

was abundant and when goat's milk flowed freely do the people tacitly acknowledge that there existed an almost mythological time when their paths led along nutritionally more suitable lines, and that while their heritage was a goodly one, a reshuffle of civilization has forced them unwittingly to stray from it.

It is not surprising, therefore, that some of the people should point to their past—to their European background or to their prowess on the war path—in support of their contention that they seem to have done pretty well for themselves in days gone by and that they are still not doing so badly. Such differences as may exist between them and other groups, they may add, are based upon financial means, and they have been forced to trim their sails accordingly. In the final analysis, they feel that *their* ways are best for them, *our* ways best for us. It is not until their attention has been drawn to the havoc which their changing culture has wrought upon their bodies that they realize how far indeed they have traveled. And then the physician is overwhelmed with requests for medical attention.

At the possible expense of over-simplification, the process through which they have passed is roughly as follows. Hundreds of years ago their ancestors, whether on this continent or in the countries whence they derived, ate raw whatever food they were able to find growing in a wild state; they learned to hunt with bows and arrows, spears and snares; they also learned to fish. Fish and meat, together with wild fruits and vegetables, provided them with an adequate and reasonably well-balanced nutritional intake. Though, to be sure, they had to spend most of their time and expend nearly all of their energies in the process of securing food, they were on the whole a healthy, hardy lot.

The time came, however, when because of conquest, overcrowding, and other causes, some of the people were forced to abandon the forest lands and streams where they had always found their food and to move on to other places. In their new homes, likely as not, wild vegetables, fish, and game were not as plentiful as they had been in the regions which they had left. For various reasons, it became necessary for peoples to find new sources of food. Meantime it is quite probable that their enemies were pressing them hard from every side.

A community of some sort seemed the logical solution of their difficulties, for it would serve the double purpose of providing greater protection against common enemies and greater nutritional security. The latter was accomplished through agriculture and the tending of herds.

It is interesting to note at this juncture that the relationship of the community to the individual, like that of the mother to the child, is essentially protective and nutritional.

The all-important question was: what to plant? Generally speaking, those crops seemed most desirable which could be cultivated most easily within circumscribed areas, which were most stable and storable, and which were consumable alike by man and beast. Cereals met these tests—wheat, corn, oats, barley. Sheep and goats offered other sources of food.

The changes which this new way of life—this greater reliance upon agriculture—brought about in the food pattern of the people had far-reaching consequences. Whereas by and large the total food supply was increased, the variety of food substances was appreciably diminished. In this process a number of essential food substances were almost wholly dropped from the menu—a fact which did not become particularly apparent to the people largely because of the perfection of the culinary arts, through which a single food source (let us say a carbohydrate, wheat) appeared upon the table in multifarious forms. Frequently an entire meal was almost wholly composed of dishes deriving from a single food source.

What of the food substances which were dropped? The buffalo as a source of meat had long since vanished; deer was becoming increasingly scarce, involving as it did the expense of a hunting license and adherence to a hunting season; cattle were already becoming a diminishing source of food because of poor lands, congested quarters, and other factors. The fact is, meat frequently came to be thought of as a condiment or relish instead of as a staple food—as something corresponding to the small piece of salt pork which we use to flavor a pot of Boston baked beans. Milk, another important source of tissue-building protein, became increasingly scarce, and with it cheese. Butter had never occupied a prominent place upon the table of most low-income groups.

In many instances, fishing came to be thought of more in the nature of a sport than as an acknowledged source of food supply. Thus it was that most of the fats and proteins were eliminated from the diet, and increasing emphasis was placed upon carbohydrates. Equally significant, fresh fruits and vegetables, important as sources of minerals and vitamins, appeared less frequently on the table. Foods low in proteins, fats, minerals, and vitamins and having high carbohydrate content,

such as grain, gave rise to a host of deficiency diseases including scurvy, beri-beri, pellagra, rickets, dental caries, and certain eye diseases, and created vicious circles in which disease and malnutrition mutually conspired to keep resistance at a low level and render recuperation problematic.

Such vicious circles had a direct and adverse effect upon the efficiency with which the body worked, and poor body economy in turn limited the effectiveness of the individual in the performance of his normal social functions. An example of these inter-relationships is offered by a certain low-income group existing in New Mexico.

The community is situated at an altitude of 5,800 feet where the oxygen content of the air is from ten to fifteen percent less than at sea level. The dietary background is one high in carbohydrates, somewhat high in fats, and distinctly low in protein. This expresses itself in the physical aspect of the people in terms of an increased body mass due to the storage of fats and in a reduced blood content of hemoglobin, the oxygen carrier of the blood. Here, where the oxygen content of the air is low to begin with, the hemoglobin should be high to enable the body to function with normal efficiency. But, to make matters worse, the obesity of the people operates in the other direction so that, as is commonly the case, it serves to disrupt adversely the relationship of blood volume to body mass.

So much for the dietary background and its effect upon the body economy of the people. How, then, does poor body economy manifest itself in limiting the individual's function in society? Here it becomes apparent in the characteristic lassitude of the people and in low resistance to disease. The vicious circle alluded to above, in which infection and malnutrition postpone recuperation, is allowed to gain headway. To seize upon a specific example illustrative of this relationship, it was found that the mere physical energy which a group of school children expended in walking to school and in participating in games during the recess period created a tissue oxygen deficit in their bodies which required the sum of all their school hours for their systems to make up. This left them in a mentally unreceptive state for study; such a condition raises the question as to whether the children should not discontinue school until such a time as their body economy is sufficiently corrected to enable them to successfully perform this phase of their function in society. Indeed, in a number of controlled experi-

ments this condition was rectified to a remarkable degree by the introduction of dietary changes.

Let us take a more fully rounded picture of another New Mexican community. This community is so circumscribed by mountains, non-arable lands, forest reservations, and restricted grazing areas that there is no opportunity for expansion. The acreage is insufficient for both "cash crops" and kitchen gardens, and the older generation are quite naturally reluctant to relinquish land to their children, thus forcing them to seek employment outside the community. The forest reservation deprives the people of easy access to fire wood; hunting licenses are too high for the average purse, though deer abound in the surrounding territory; the cost of grazing permits has reduced to five the number of families who still keep milch cows; beef is rarely slaughtered, hens only when their laying capacity has been reduced; and veal, mutton, and lamb are purchased sparingly on account of their high price. The resulting diet, high in carbohydrates and deficient in vitamins and minerals, has given rise to a shockingly high incidence of many of the diseases enumerated above. Tonsillitis among children and eye disease and arthritis among adults stand at above forty per cent, and dental caries is present in more than ninety per cent of the people, children and adults alike. Upper respiratory infection is prevalent in winter, dysentery in summer, and tuberculosis at all times.

It becomes quite obvious that any attempt to improve the nutritional standards of such a low-income group calls not so much for a program of education in dietetics as for agricultural-economic changes which will make proper foods available. In this particular instance, an ultimate solution may possibly lie even in drastic redistribution of the lands within the area at large.

Expressed in other terms, it is all very well to say that what a diet lacks is orange juice and butter, but quite another thing to expect use of them to be made in a community which is capable neither of producing nor purchasing them. A fundamental rule in effecting dietary changes is that the foods and methods involved should be familiar and adaptable to the people. Observation of this rule gives some assurance of the permanent adoption of the changes indicated. In some communities, for instance, goats have been successfully reintroduced as a source of milk supply; in others, carp ponds have been installed and the people taught to extract oil from the livers of the fish to be used in treating rickets. Again, instruction has been given in growing and

preparing yeast as a cure for pellagra, and in extracting water from green peppers as a treatment for scurvy. Of course, the principle of curative doses in large quantities, as against the normal vitamin intake capable of maintaining good health in a person not suffering from a deficiency disease, has to be emphasized. On the other hand, if vitamin tablets were introduced, their connection with the nutritional program as a whole might not be appreciated. There is danger that they will be thought of in the same category as aspirin tablets and that they will soon be discarded as such.

In conclusion, any nutritional program which has as its objective permanent changes in the culture pattern of a people should take into consideration and carefully weigh the pre-existing ethnological background of the group involved. If possible, the people should be made aware of the evolutionary processes through which they have passed which make such changes necessary. All geophysical and agricultural-economic factors—such as climate, altitude, water, soil, seasons, and, in short, everything which brings to bear upon body economy on the one hand and food availability on the other—should be given their proper place in the picture as a whole. And, finally, such remedial steps as are recommended should be made to appeal to, and to be readily taken up by, the ethnic group in question. Such steps pave the way to a more efficient performance of the individual's function in society.

[The author of this article has endeavored to simplify for purposes of convenience the anthropological aspects of nutrition. He is well aware of the complexities of agricultural development among primitive peoples and does not pretend that the brief survey of this development given here is historically correct in every detail or that it takes account of variations among groups.—M. P.]