A Nutritional Cacophony or The Crisis of Food Selection in Affluent Societies*

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To say the least, eating is a very complex activity. At the biological level we must satisfy our nutritional needs, both in terms of getting enough energy and of getting an adequate balance of the 30–40 essential nutrients. But eating and food selection have many other dimensions; cognitive, symbolic, cultural, and social. Thus simple (and simplistic) biological and behavioral analyses of eating behavior and food selection are inappropriate. The physiological dimension of eating extends into culture and the individual psychological dimension to social or collective behavior. Humans do not simply eat their food; they also think about it. They turn it into a cognitive and cultural construct.

This chapter addresses these problems in terms of man the omnivore. In the first part, I shall discuss some very basic, universal traits in the relationship of humans with their food. Understanding the consequences of these traits sheds lights on the function of culinary cultures or cuisines. The second part will deal with contemporary societies in the developed world, trying to show how some of the needs arising from the basic traits are no longer met. This results in some specifically modern problems, one of which I shall call dietary cacophony. The third part of this chapter will deal with some of the problems that this dietary cacophony and chaos raise for public health policy, dietary prescriptions and prohibitions.

Both the assessment of risk associated with dietary practices and the measures and recommendations aimed at reducing this risk raise issues that are difficult to solve. In all probability, one important question we shall have to deal with in the next decade is whether excessive concern with nutrition might be detrimental to public health. If such is the case, scientists of all disciplines may very well have to review very carefully what is said and done in this respect, particularly by themselves.

* I am grateful to Peter Leathwood for his translation of this text from the French.
TABLE 1. Edibility vs non-edibility of some animal species in areas of the world

<table>
<thead>
<tr>
<th>Edible</th>
<th>Non-edible</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSECTS</td>
<td>Western Europe, North America, etc.</td>
</tr>
<tr>
<td>Dog</td>
<td>Europe, North America, etc.</td>
</tr>
<tr>
<td>Horse</td>
<td>Britain, North America, etc.</td>
</tr>
<tr>
<td>Snails</td>
<td>Europe, North America, etc.</td>
</tr>
<tr>
<td>Frog</td>
<td></td>
</tr>
<tr>
<td>Latin America, Asia, Africa, etc.</td>
<td></td>
</tr>
<tr>
<td>Korea, China, Pacific, etc.</td>
<td></td>
</tr>
<tr>
<td>France, Belgium, Japan</td>
<td></td>
</tr>
<tr>
<td>France, Italy, etc.</td>
<td></td>
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<tr>
<td>France, Asia, etc.</td>
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SOME BASIC TRAITS OF THE HUMAN OMNIVORE

Three characteristics of the relationships between man and food seem to be universal.

The first trait is an aspect of cognitive function which extends well beyond eating. The human mind operates as if it had to classify everything. As Tylor, an early British anthropologist, put it, it tends “to classify out the universe.” Nowhere is this feature more clear than in the realm of food. Individuals in all cultures, from the most “primitive” to the most complex, categorize foods. To identify a given item that is a potential food, we classify it; we try to decide its place in the world. In the much quoted phrasing of Lévi-Strauss (1), food must “not only be good to eat, but also good to think.” A food culture, a culinary system, provides us with a way of doing precisely that: ordering the universe, classifying it out.

Consider a very simple example: what is food and what is not. As Tables 1 and 2 show, from one part of the world to another, the mere definition of which item is edible and which is not is subject to remarkable variability. Insects can be a very good source of protein, and some are considered delicacies in certain African, Asian,

TABLE 2. Animal species and products commonly consumed in 383 cultures according to the records of the Human Relations Area Files

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of cultures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken (flesh and eggs)</td>
<td>363</td>
</tr>
<tr>
<td>Cattle (flesh and milk)</td>
<td>196</td>
</tr>
<tr>
<td>Pig (domestic)</td>
<td>180</td>
</tr>
<tr>
<td>Fish</td>
<td>159</td>
</tr>
<tr>
<td>Sheep</td>
<td>108</td>
</tr>
<tr>
<td>Duck</td>
<td>67</td>
</tr>
<tr>
<td>Turtle (flesh and eggs)</td>
<td>46</td>
</tr>
<tr>
<td>Dog</td>
<td>42</td>
</tr>
<tr>
<td>Rat</td>
<td>42</td>
</tr>
</tbody>
</table>

Adapted from ref. 2.
and Latin American cultures. In contrast, insects are perceived as simply not edible and particularly repulsive by most European and North American populations. Nearer home, frogs and snails are considered as food by the French (even if numerous individuals dislike them or even find them disgusting); but other cultures would be appalled at the idea of eating either of them. There is no immediate, clear nutritional or organoleptic rationale to explain these differences in perception. Even if they are not totally arbitrary, and may be rooted in historical or ecological determinisms (3), nonetheless they are cultural norms that each individual accepts with little or no further thought.

Even when a particular species of plant or animal is considered edible, that is far from being the end of the story. A cascade of further classifications and taxonomies come into play. A food may be appropriate to eat at one time (e.g., breakfast but not dinner; during a festival but not on an ordinary day), may be eaten by some people but not others (foods for adults, children, the elderly, the sick, etc.), may be eaten only in association with another food yet be incompatible with a third.

That we categorize foods and relate them one with another or with particular consumers or circumstances implies the existence of complex rules regulating the links between different foods, their component parts, their preparation, their consumption, and the behavior of the eater. These classes, rules, and norms are the basis of food cultures or cuisines.

Most of the time we are unaware of these rules, even though we may apply them daily in our eating. We can bring these rules to awareness when we try to ignore them or when we come into contact with another culture with different norms. Eating croissants for dinner or spaghetti for breakfast would make most Frenchmen uneasy (many English children, however, would consider spaghetti on toast a perfectly normal breakfast). Live oysters are considered a delicacy, but offering them with hot chocolate sauce has not yet reached the imaginations of the proponents of nouvelle cuisine. Cuisines have often been compared with language. All humans speak, but they speak different languages; all humans eat, but they eat different cuisines. Each society, ethnic group, or social class has its own language of food, which members "understand," while it may be "incomprehensible" for others. Furthermore, errors of grammar or syntax bring the rules sharply into focus.

A second universal characteristic of our relationship with food may be described as the principle of incorporation. *In-corporation* is, quite literally, the act of taking a food into the body: the food passes the frontier between the outer and inner worlds, between outside and inside. It seems that, throughout the world, consciously or unconsciously, people believe that they take on some characteristics of the food they eat. This is illustrated by the German proverb "Man ist was man isst," ("You are what you eat") (4). In certain populations, warriors avoid eating hare, for fear they will run away; pregnant women avoid pork for fear of giving birth to an ugly child (5). This way of thinking is far from being limited to "primitive" societies:
contemporary ones will equally consider that foods can somehow "contaminate" (positively or negatively) the eater.

Until recently, in France as well as in many western industrial countries, red meat was thought to provide strength and vigor. Even the potato eaters of van Gogh have the same color skin as the tubers they are eating. The principle of incorporation influences many of man's efforts to find a clear identity. If you are what you eat, it is quite natural to try and influence who you are by carefully choosing what you eat.

A third fundamental characteristic of our relationship with food can be described as "the omnivore's paradox" (6). Humans are omnivores. Being an omnivore means being subject to an ambiguity. The omnivore is adaptable and free to eat a wide range of foods. In contrast to the specialists (carnivores, herbivores, etc.) the omnivore can adapt to a wide range of foods. But there is one severe constraint: unable to obtain all the nutrients needed from a single food source, the omnivore needs to eat a variety of foods. This is the basis of the paradox. On one hand, needing variety, the omnivore must be "neophilic," i.e., prefer diversity, innovation, exploration, and change. But on the other hand, the omnivore has to be conservative, suspicious toward new foods, because any unknown "food" is a potential poison, a danger. Thus a form of anxiety appears to be literally built in the condition of being an omnivore. The "double-bind" implied by these conflicting, paradoxical needs, neophobic and neophilic is the source of it.

The Function of Cuisines

The functions of cuisines can be analyzed in terms of the three fundamental characteristics outlined above. First, cuisines provide a series of rules, which, as it were, help to keep the world in order, if only in the eater's mind. Second, they help define who we are by way of controlling incorporation. Third, cuisines help resolve the omnivore's paradox: novelty, the unknown, can be steeped in the sauce of tradition; originality is tempered by familiarity; and monotony relieved by variety (6). Moreover, the complex sets of rules involved in any given cuisine (preparation, table manners, appropriateness of foods for people, occasions, time, weather, etc.) provide a structure for individual and collective behavior, a framework for everyday life.

Symbolically, the culinary act sanctions the passage of food from Nature to Culture. It thereby helps to resolve the omnivore's paradox or to make it manageable and to regulate the anxiety of incorporation. Here we see one of the fundamental virtues of cooking: once cooked ("cuisined" as they say in French), adapted to the conventional rules of a particular cuisine, food is marked with a stamp, labeled, recognized—in a nutshell, identified. "Raw" food is fraught with danger, a "wildness" that is tamed by culinary treatment. Once marked in this way, it is seen as less dangerous. It can safely take its place on the plate and then in the eater's body. It sets all these things in the order of the world and so confirms that the world is
still in order. A cuisine enables neophile innovation to be reconciled with neophobic "conservatism" or distrust.

SOCIAL CHANGE AND THE MODERN EATER

Socioeconomic change in modern Western societies has entailed considerable modifications in our relationship to our food. Urbanization and industrialization, changes in the structure of the family, and demographic trends, all tend to have the following effects:

(1) With increased processing of agricultural products and the development of modern distribution, an increasing part of the preparation and cooking has been moved from kitchen to factory. It is now performed before the food reaches the home, away from the eyes and knowledge of the eater.

(2) The modern eater has become a "pure consumer": more and more people are completely ignorant of the history, origins, and production of the food they eat.

(3) The sociocultural context of culinary systems (cuisines in the sense outlined above) that traditionally determined what should be eaten, by whom, and when, has rapidly changed. Social norms are eroding or loosening. Where social rules prevailed in food selection, individuals now have to make conscious decisions on a daily basis and are left with numerous, often conflicting, criteria to do so.

In all developed countries, market research shows the existence of a trend toward apparently unstructured food intake. In France for instance, in a growing part of the population, the structure of the traditional food pattern tends to become less constraining (length of meals, number of dishes, snacking, skipping courses or meals, etc.) (for a review, see reference 7).

(4) Modern food is increasingly difficult to identify by its sensory features: flavor, smell, and texture only. It is now processed, conditioned, packaged, loaded with information and signs.

(5) Moreover, as food technology becomes more powerful, it uses increasingly sophisticated processes tending to mask, imitate, and transform "natural" or "traditional" products. Thus consumers have all the reasons to perceive processed foods as mysterious artifacts, somewhat threatening Unidentified Food Objects. Incorporating such "UFOs" is clearly uncomfortable. Quite literally, modern eaters know less and less what they are really eating. We have seen that, because of the principle of incorporation, clear identification of the food is felt necessary by man the omnivore. Not knowing for sure what they are eating, modern consumers feel suspicious of what processed foods are doing to them (or turning them into). Such a situation constitutes favorable ground for food scares and reactions in the form of food fads.

The erosion of traditional, culinary patterns has an important consequence: to a large extent, the resolution of the omnivore's paradox no longer occurs. The eater must make daily decisions about the selection of his/her food, and those decisions can no longer be based on widely recognized, implicit, rules of selection.

Moreover, there is an increasing number of sources offering prescriptions,
information, directions for food selection and eating behavior. They often are dissonant. Clues from processors, drug producers, consumer organizations, various medical disciplines, all compete for the consumer’s attention and compliance, creating a nutritional cacophony.

In short, modern, industrial societies tend to provide the consumer with increasing autonomy from traditional rules for making decisions about food selection. But autonomy may degrade into anomy, which sociologists define as an absence of social rules by which individuals can orientate their attitude and behavior. We have jumped, without much of a transition, from heteronomy (rules for individual behavior are imposed collectively, by culture) to autonomy (rules are selected or generated by the individual) and anomy (a void or an overflow of conflicting rules). To a large extent, modern distrust over the safety of food and concern about the appropriateness of diets stem from the anxiety associated with the ambient nutritional cacophony. The dramatic increase in consumption of cookbooks and diet books in the bookstores, and of recipes and diets in the media, is probably but a manifestation of that anxiety to the extent that it may be an expression of a growing demand of rules and directions for food selection. Surveys and polls in Western countries show that, at any one time, between one-fifth (France, Italy) and one-third (United States) of the population are following some form of diet (7).

NUTRITIONAL INTERVENTIONISM AND HEALTH EDUCATION

Health policies, nutritional education, and dietary guidelines have been developed in response to what are perceived as serious health problems brought about by the evolution of food habits in modern society (the “diseases of civilization” as they are sometimes called). However, they can equally be considered to be a form of social response to the anxiety about food selection described above.

Like sex, food is particularly subject to moral judgments and ideological bias, as is evidenced by the long string of medical theories and popular beliefs on such topics as sugar, meat, fiber, fat, and last but far from least, cholesterol. Foods are subjected to binary moral judgments like characters in a detective story, as if the problem were to designate a culprit for the eventual eater’s death. In this “theater of food,” fiber is currently cast in the leading role. Sugar, once a popular hero, became a major villain in the seventies (“pure, white, and deadly”) and is currently being reluctantly rehabilitated (8,9). Fat has now taken over the part of the ultimate villain, with a Jekyll-and-Hyde personality: unsaturated, admirable; and saturated, heavy, and deadly. Cholesterol experiences the same process, with “good” HDL desperately fighting “bad” LDL in press coverage.

Medical and scientific experts, including all of us taking part in this workshop, are influenced, consciously or unconsciously, by moral judgments and social attitudes. This should come as no surprise. As scientists, we are not isolated from society, nor are we immunized against the beliefs, ideologies, values, or fashions of that society. We are not protected against conflicts of interest, nor are all of us
totally without stakes in the economic, social, and political power games of society. Extreme vigilance and self-criticism are essential.

The different factors outlined above have, especially in the last 20–30 years, influenced the modern eater's view of food, with some important practical and theoretical consequences.

One consequence of the principle of incorporation is that we (including the epidemiologists) are tempted to regard food as the prime source of our ills.

The cacophony of nutritional advice is getting louder and louder. Agriculture, industry, consumer groups, and various "public interest" organizations finance research aimed at establishing or verifying their own view, or at refuting those of their opponents: economic rather than scientific criteria thus increasingly determine the questions asked and hence the answers found. These contradictions add to the confusion of the consumer.

Scientists themselves seem to forget that the essence of science is that it *must* be subject to permanent revision. In the very words of Karl Popper, in order to be truly scientific, a theory must be "falsifiable" at any time. A theory is "scientific" only if it can be refuted. If this condition is not satisfied, we no longer have a scientific theory, we have dogma. Thus one might say that promoting dietary guidelines as the ultimate and final scientific truth implies to a certain extent an unscientific attitude catering to the public's erroneous view according to which science is the alpha and the omega of eternal truth.

Another currently common epistemological and methodological error is the confusion between correlation and causation. Epidemiological evidence, based on correlation alone, is all too often the main justification for advice to modify food practices. Prohibiting one food or prescribing another can be justified if we understand the precise mechanism by which they menace or protect health. It is at best disputable to base advice on speculation and dangerous to dismiss as heretics scientists who do not toe the party line.

Populations are too often treated as if they were homogeneous and composed of "average individuals." Differences due not only to genetic variability but also to sex, age, social class, etc., are often ignored or understated. Dietary advice is addressed to the whole population without discrimination, while illness and health do discriminate. In developed countries, for instance, as has been shown as early as the sixties (10), massive obesity is more frequent as one descends the social scale, but it is the richer, educated classes, more preoccupied by health and nutrition, who are more likely to be influenced by advice.

Too often, one discipline seems to ignore or be ignorant of the preoccupations of the next. Cardiologists and nutritionists have for decades emphasized the perils of fat, both in the body and in the diet. Psychiatrists, on the other hand, warn that they are now faced with a pervasive obsession for losing weight and an increasing prevalence of severe eating disorders. The media and fashion are usually blamed for the obsession with a lean body, and there have even been proposals in the United States to regulate the images of women used in advertising by prohibiting representations and praise of excessive leanness. But the idea that we "dig our own graves with our
teeth" did not come from the media in the first place. In 1989, 63% of French adults considered they usually ate too much as opposed to only 50% in 1972 (11,12). The French increasingly believe that they eat too much, while energy consumption has actually been going down dramatically since the beginning of the century (13). In a way, the medical profession, with the help of the media, may have been only too convincing to some.

While the guidelines are still suggesting that we all need to lose weight, voluntary weight restriction, if only because it is closely related to aberrant diets and severe eating disorders, is becoming an important public health problem, perhaps almost as important as excess, as the epidemiology of eating disorders suggests (14). If this is true, a major aim of public health policies should be to reduce people's anxiety about the food they eat, rather than to fuel it by hastily proscribing or recommending nutrients or foods.

Some epidemiological findings are doubtlessly more solid than others. One of them is that, statistically, the main risk factor for cardiovascular disease, cancer, and other diseases typical of affluent societies, is age. It is thus scientifically safer to blame increased life expectancy than "plethora," "indulgence," or other moral constructs, let alone "evil" foods.

REFERENCES

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DISCUSSION

Dr. Kumar: Rapid change in life-styles in low income developing countries often interrupts traditional eating habits. You touched on the notion that "people think they are what they
eat." This points to the importance of role models set by the visible rich, by advertising, and indeed by the Western world on what foods are considered desirable to eat.

Dr. Fischler: One problem is that in the developing countries, and even in working-class cultures in industrialized nations, there is not the degree of concern about food and eating that well educated people now display in the West. Recently people were asked in California if they knew what a sensible diet was. It turned out that over 60% did not. Nutritional programs and dietary guidelines are really addressing the section of the population that is at risk of nutritional problems, but the people who read and understand them are in the main; those who are unlikely to have problems with poor nutrition.

Dr. Ashwell: You said that part of the food crisis was conflicting dietary guidelines. I don't think there are conflicts in the guidelines when you talk in qualitative terms, only when you try to pin down quantities. In the straightforward terms of what is a well-balanced diet the message has not changed.

Dr. Bauer: What is the role of instinctive behavior in food selection?

Dr. Fischler: There was some evidence from the early part of the century that young infants offered a "cafeteria" diet were by and large able to regulate their nutrient intakes satisfactorily. Subsequent work disproved this, showing that the critical factor was the choice of foods put on the platter by the experimenters. It appears that humans have no inborn competence to select a satisfactory diet. Our main competence is social learning.

Dr. James: You have described the "dietary crisis," but what are the fundamental pressures that have led to this crisis? Are you saying that a product of the agricultural revolution is a form of monoculture where the advantages of single products are so great that traditional farming communities are withering away?

Dr. Fischler: Industrial processing and modern distribution are the key factors. We do not see where our food is coming from or what kinds of processing it has undergone. Food is just another manufactured artifact. This has turned us into pure consumers—very different from being producers and preparers. Our suspicion and anxiety about our foods has increased as a result.

Dr. Georgala: The technological revolution in food has been mostly about its production, preservation, and processing. In the future technology will allow the generation of a wide range of novel foods with different types of sweetness, and different ways of delivering proteins, fats, and carbohydrates. One could foresee a time when people will be totally dissociated from the agricultural background of their food and will make choices based solely on the eating characteristics of the foods. It should then be possible to design foods to meet specific nutritional targets.

Dr. Fischler: I fear this is a somewhat overoptimistic view, at least in the near future. Besides, nutrition is fine, but don't forget taste. . .