

FOOD AND CULTURE: MEASURING THE INTRICACY OF RULE SYSTEMS

We are very happy that in her seminar on November 20, 1980 Professor Douglas shared with us her ideas on food and culture. As students of human movement we are interested in Douglas and Gross' categorical structure, and the concept of 'intricacy', since the latter is tied to notions of 'ceremonial' and 'ritual', and the authors suggest that it could not only be applied to other rule based systems, but be used to inter-relate them. They say that "If the intricacy of food changes, so, we expect, will dress, space, singing and speech", and propose the possible discovery of a 'law of relative intricacy' (pp. 159-60 below).

Particularly provocative are statements like: "...space might have many advantages over food since spatial characteristics and traffic flows are essentially measurable...Movements through space can provide the containing structure for other rule systems...Using the sequential flow of objects through space as case material suggests a characteristic of intricacy that would be less easily seized in another medium" (See below pp. 153-4).

One notes that in 'Sacred Spaces...' (Williams, 1978) there is the beginnings of such a study of 'the sequential flow of objects through space' in the Latin High Mass, because one of the characteristics of that rite (as of many others) is precisely the semantic properties of objects used in human ritual contexts. -- The Editors.

An Under-privileged Field of Cultural Analysis

The study of food ought to enjoy a privileged status in cultural analysis. It combines the concrete and the ephemeral, it meets physiological and social needs, it provides the free gift of hospitality and the strict requirement of biological survival. But there are grave difficulties in the way of according to the subject the seriousness it deserves. Certainly the connection between food and culture has been much discussed. But from the enormous pile of miscellaneous reports only a few generalizations have emerged and they remain still at an almost platitudinous level. We are agreed that human food is a prime constituent of social relations. We agree also that it conveys social meanings. In consequence of these social functions it tends to be organized in systems of rules about what food should accompany another and rules about what precedes and what follows. Though this rule-bound aspect makes it an instrument for communication, it is crude and slow compared with speech. Anthropologists tend to wave these cultural aspects of food at nutrition scientists like some warning flag: look out! There is more to this subject than nutrient inputs and digestive processes. The dieticians and food scientists are ready enough to recognize a peril in neglecting the cultural aspects of

preparing and eating food. But they need to get past the anecdotal stages. When we anthropologists try to go beyond the generalizations, we merely reiterate that the social context and local pattern of values must be taken into account. We freely offer our services to advise on specific problems and plans, but we have no theoretical scheme which focuses cultural analysis upon nutritional problems. One way to develop this needful theoretical strengthening is to start asking questions about the said general principles. We will illustrate by asking of each principle, does it always hold good? Do its applications vary in strength? Is it affected by the type of social organization?

If we begin with the principle that food is a prime constituent of social relations, we can see at once that it does not always hold good. There are many social relations which are not constituted by shared food, as for example in the bureaucracy, where the director has coffee brought to him to consume alone, while the secretaries meet for a convivial coffee break. Then again, there are regular solitary eaters, and among those who do share food, there are times and places for solitary consumption. When Mark Twain wrote to his wife enthusiastically about English food habits, and especially about how his digestion had improved with the regular gin and tonic before meals, we suddenly see the conceptual gulf between food and medicine open with his ending request that she please stock the bathroom cupboard with gin and tonic against his return. Could there be a cultural theory about when food is not a constituent of social relations that might conceivably be of use to nutritionists? Is there a society which makes no difference between nutrients stocked in the bathroom and those in the larder? Is there a theory about the kinds of society that make less use of food for defining social events and conveying social meanings? Is food sometimes presented in a less rule-bound context than at other times? We suspect with reason that this is the case and that the degree of rule-boundedness indicates much about the kind of human society that does the eating or about the particular kind of occasion. Our famous old generalizations become much more interesting when we realize that they apply with varied force. If we could develop sub-theorems about the social conditions in which the cultural role of food is modified we could make the anthropological statement less hackneyed. But the challenge would still remain as to what we could find that would be helpful to scientists interested in good nutrition and malnutrition.

Supposing we could suggest some social correlates for variety in the diet; that could be extremely interesting for nutrition. Suppose we could find a connection between the load of communication values carried in a food system and the amount of variety. Or suppose there was a way of identifying from the social relations the proportion of the population that is going to be allowed to fall far below the average nutritional status or the social pressures to overeat. We could try to classify the kinds of social system in which all members are guaranteed equal access to food resources. Research in any of these directions would be at least a sign of good will to provide a new collaboration between nutrition sciences and anthropology. But it would need a new method of observation, some new concepts and some new measures.

In what follows we introduce a measure intended to indicate several things about the social uses of food. One, the extent to which the people are using discriminations in food to respond to a range of cultural events; how wide the range of variation which food is used to express, and three, how much the use of food to create structuredness in social events varies within a given culture. For this we use the word intricacy in a technical and limited sense. The more the behavior connected with food is intricate, the more it differentiates between minor and major occasions. Our emphasis is not on structuredness as such, but on cultural differentiation made through food. When we have explained the idea of intricacy, we will return to possible practical implications. The way we have identified intricacy is also a clue to something that may be called cultural linkage, and by the same measure, to social exclusion. In some parts of a society everyone may be tuned in to what everyone else is doing: their own exertions are either straight copies, or recognizable variations on the public themes. King Henri IV wished that every peasant in his kingdom of France would sit down with his family to poule au pot on Sundays. If everyone indeed did eat exactly the same menu on a given day, such cultural conformity would serve also to distinguish Sunday from weekdays. Intricacy measures are relevant to these aspects of culture. Going beyond Sundays to larger festivities, for everyone to know what should be done for an acceptable wedding or funeral, the cultural standardization is only part of the scene. Immediately one asks how individuals fare if they do not have the wherewithal to celebrate according to the standard: do they manage to borrow? Is there an accepted poor-man's version of the event? Or is the standard a principle of social exclusion? With close cultural linkage food can be elaborated into an efficient vehicle of communication and excommunication. But the scope for food to be a communicator of messages about occasions and social roles is limited by the extent of agreement on what the occasions and roles may be.

We cannot take for granted that the demand for elaborated communication through food has to be met by rich dietary variation; the changes in signals can be very simple and worked through a limited range of nutrient elements. It is more likely that if we can establish measures of cultural linkage through a population, we may find correlations holding between relatively weak cultural linkage, social isolation and malnutrition. But we cannot begin to pose such questions until we have delved more deeply than is customary into some very academic questions about food as a vehicle of information. Only in a much more profound methodological analysis can we hope to go beyond the accepted truisms about culture and food.

### Systems of Signs

First let us start with the idea that the way particular food is served can be read off by members of the culture as a selection from a locally limited set of possible statements about kinds of social events. Imagine a traveller, returning unexpectedly after a long absence, who finds a large gathering of friends at home. How much can he tell from inside knowledge of the culture what kind of celebration it is? Suppose he can tell at a glance that he has not coincided with a funeral party or

wedding. The clothes, the decorations and the demeanor of the guests are not consistent with either. Several signs, red carpets, bright lights and music make him think it is a major event, but the average youthfulness of the guests suggests he can rule out the possibility of a Golden Wedding. He cannot be sure that this is not a son's 21st birthday. He has tried to use clues from behavior and from the age of the guest list. He can tell from the food on display that it cannot be Christmas, Shrove Tuesday, Easter, Thanksgiving or Halloween. It is someone's birthday? Whose? When someone tells him that they are in fact celebrating a wedding, he is incredulous: no formal attire, no lineup to kiss the bride, no first, second and third speeches or toasts, no procession to inspect the gifts, above all, no cake, no champagne. What a falling-off from the celebrations he used to know in which every minute of a wedding would have been identifiable in a long sequence of enactments specific to weddings.

As we trace his problems of identifying the event, we realize that though the possibility of very detailed discrimination of one event from another is a potential in any system of celebrations, it cannot be recognized in any one event seen by itself. It is a potential that lies in the system as a whole. It also lies in the hands of everyone in the community to maintain, to increase or to weaken. Only their own readiness to make a set of complex public rituals produces for the members of the community a highly differentiated set of shared meanings. If they slacken their criticism of the appropriateness of a particular event, if they neglect to attend each other's ceremonies, omit praise for meticulously timed series of culinary triumphs, next time around the number of sharp differentiations will tend to decrease. The meanings may become so blurred that it may be acceptable to serve the same baked meats for a wedding as for a funeral.

In some previous research we have tried to look in an ad hoc way for the regular variations in the structure of meals that betoken the different points in the daily time-table and the different days of the week. Michael Nicod's research in Britain in 1974 was specially interested in the capacity of food to mark social occasions and statuses. He managed to develop a method of describing an extremely compact, well-structured system of food (unpublished ms). Though it is familiar to anyone who has enjoyed English hospitality, it is worth describing just to remind the sceptic of how much more patterning there is in a behavioral system than first meets the eye. English working-class families use two staple carbohydrates: potatoes and cereals. Alcohol is not taken with meals; normally cold water is drunk throughout and the meal may end with hot coffee or tea. Meals rank themselves according to joint criteria of quantity and ceremonial complexity, which is shown in rules about plate changing and extra utensils. He found that the two criteria go together, the more ceremonious, the more copious the meal.

Michael Nicod introduced and defined for his research purposes certain terms: food event; structured event; snack; meal. A food event is an occasion when food is taken, without prejudice as to whether it constitutes a meal or not. A structured event is a social occasion which is organized according to rules prescribing time, place and sequence of actions. If food is taken as part of a structured event, then we have a meal. The latter is distinguished from the snack according to the following

definition: A snack is an unstructured food event in which one or more self-contained food items may be served. The event is unstructured insofar as there are no rules to prescribe which items should appear together and there is no strict order of sequence when more than one item appears. Snacks may be separable from but capable of accompanying a drink. The meal by contrast has no self-contained food items and is strongly rule-bound as to permitted combinations and sequences. Together with the distinction between special and common food events, these terms constitute the tools of the analysis. Simple Venn diagrams were used to record which members of the family and which categories of visitors were present for each kind of meal.

After some experimenting, it proved most useful to fasten attention upon sculptural and sensory qualities of the food and to compare its arrangement in the dimensions which seemed regularly used and valued: quantity, salt/sugar; temperature; dryness. (In English cooking a strong dichotomy between salty and sugary is central and explicitly referred to as savory or sweet.) Under this gross classification, the food served on the table was able to be correlated with the kinds of regular social events which marked a meal.

Ignoring the names for the meals and concentrating only on the ranking, there are three kinds of meals: A, a major meal, is served at roughly 6:00 P.M. on weekdays and early afternoon on weekends; B, a minor meal, usually follows this at 9:00 or 10:00 P.M. on weekdays, and at about 5:00 on weekends; C, a still less significant meal, a tertiary food event, consisting of a sweet biscuit and a hot drink, is available in this system to be used at different times, say at 4:00 P.M. on return from the factory on weekdays, to welcome a visitor at any time, and at bedtime on weekends. Breakfast does not enter into the system as a meal. If asked, Nicod's subjects said they never had breakfast, just a cup of tea, just a piece of toast, or that they had what they liked. This range of answers allows breakfast to stand as a snack according to our definition of the word. The great and famous English breakfast would seem to be outside the urban working-class tradition, except on Sundays, if the evidence from these four families can be extended.

A close correspondence between the structure of the Sunday and the weekday evening meal A appears at once. In both cases the first course is the main course, and it is always hot and savory. It has a three-part structure based on a serving of potato, plus a centerpiece (meat, fish or eggs with one or more vegetable garnishes), the whole plate soured in rich, brown, thickened gravy (here called dressing). To celebrate visitors or feast days the special meal may have more than one dressing and the centerpiece is always meat; otherwise the rules of combination are the same.

The second course shows a repetition of the rules of combination of the first course, except that now everything is sweet not salty; sugar is on the table for sprinkling over the food in the same way as salt in the first course. There is also more freedom in the second course to serve one element and omit another in modifying for everyday occasions the three festive prototypes of dessert, i.e., plum pudding, trifle and fruit tart. The pudding course varies freely upon the theme of cereal, fruit

and cream; on the one hand the fruit may be diminished to a thin layer of jam or a mere streak of color in the jelly of a trifle which consists mostly of juice-soaked cake and custard, and it may disappear completely in a rice pudding; on the other hand, the fruit may dominate over everything else, as in the fruit pie, or the cereal may be omitted, as in tinned fruit and custard. Ordinarily, the sweet dressing, though thicker than gravy, is poured over the plate in the same way as gravy in the first course. On Christmas Day the special "hard sauce" or "brandy butter" is too solid to pour. So we see a tendency for dressing to be thicker from the first course to the second and thicker between ordinary and celebratory occasions.

On Sundays and other special occasions, when the second course is nearly finished, preparations are made for the third part of the meal, the hot drinks and biscuits. Hitherto only cold water has been drunk with the food; the variations of liquid and solid are carried out upon the plate of food. Now in the third course total segregation of liquids from solids appears: in the cup is a hot drink, on the plate a cold, dry solid, a reversal of the hot/cold pattern of the first course, when the cold drink is in the glass and the hot food upon the plate (Appendix). These rules relate the three courses to one another in an overall pattern; the meal starts hot and finishes with cold solids; the quantity decreases with each course; formal patterning increases with each course. That is to say, regularity in a three-dimensional sculpted shape is not at all required or even appropriate for the first course. One might say that the meal begins by looking like a haphazard, natural pile of food on the plate, and moves on to a formally designed cultural artifact, the cathedral-like dome of the jelly mold, the geometrical design of cherries, colored sugar crystals patterned over the bowl of custardy cake, the smooth spherical sides of the plum pudding. Incidentally, the generic term for some of these sweet items is "shape" as in chocolate shape, pink shape. The almost solid cream dressing on feast days is also able to hold a shape. These differences between Course 1 and Course 2 themselves are reinforced in Course 3 so that they become themes which constrain all the courses into a single consistent structure (Table II).

It is no surprise to the native Englishman that the distinction between hot and cold is critical in this dietary system. For the third course the teapot is carefully heated before the water is poured in, actually on the boil; the plates for the first course are kept stacked on the rack above the cooker so that they are carried to the table warm. Apart from bottled sauces no addition of cold foods to a hot plate is permitted, nor vice-versa, so cold tomato is not compatible with hot meat.

Looking again at Table II we can see that the three courses of main meal A in some of their rules of combination present the same structure as do the three meals of Sunday, so that a unitary frame holds the pattern together right across the week. When we consider the rules governing meal B the same pattern is reinforced still more (Table III). The regularity of the pattern is so strong that it can be made to bear some weight of explanation. For example, before seeing the structure laid out, one could have asked reasonably why they never serve potatoes in meal B. The answer now would be that potatoes are the staple for meal

A Course 1. That part of the pattern would lose its distinctiveness if potatoes were served in Course 2 or meal B. Or if one asked why the main meal starts with hot solids and ends with cold ones, the answer to "why" questioning has to be given in terms of a pattern that would lose its distinctive recognizability if a change were made (Table IV).

The sequence, ranking and rules of the three meals of Sunday are now mapped on to the three courses of the main meal: first the potato meal, second the main cereal meal, third the last cereal, sweet and dry. Scanning the rules we see that the last course of the first two meals and the only solid of the third meal is exactly the same item, except that it is progressively drier. Going from pudding to cake, the lavish dressing has originally been poured over the cake, but instead of being a viscous custard it is set in the form of soft frosting. The option to select any of the possible ingredients of a second course in the main meal is even more open in the minor meal, but working through the menus, week-by-week and month-by-month, the prototype puddings are recognizable in the second part of the minor meal in their dry forms, as plum cake and jam sponge cake. When it comes to the final course of the main meal or the last meal on Sunday night, the range of sweet biscuits reveals the pudding again, in its most dessicated forms: currant biscuits; sugar-coated biscuits; jam-centered biscuits. Insofar as the sweet biscuit that may be eaten last thing at night on Sunday is a dry version of the cake, and the cake a dry version of the pudding, we can regard it as a summary form, literally, of those courses. The biscuit is capable of standing for all the sequences of puddings through the year and of wedding cakes and christening cakes through the life cycle.

One meal, one days' eating, even one weekend does not give enough time to discern the pattern. In each dietary system the duration of the whole pattern is likely to vary. This particular British one comes to its great climax with the life-cycle event celebrated with the white, glittering three-tiered architecture of the wedding cake. Its frosting is so hard that it takes a sword-sized knife and the combined efforts of the bride and groom to cut into it. Our analysis is beginning to reveal a dietary system which has the mimetic and rhythmic qualities of other symbolic systems. The capacity to recall the whole by the structure of the parts is a well-known technique in music and poetry for arousing attention and sustaining interest.

The description of the principles adopted by an English housewife for constituting her family meals can be summarized in a few rules. In the very simplicity and economy of the dietary system, the normal principles of recognition and stable structuring are at work. The housewife can serve a meal that will be acceptable to her family so long as she works within certain restrictive patternings of sequence and combination. Novelties do not present a challenge so long as they are introduced within the pattern. For example, spaghetti in tomato sauce cannot be served as a main course in the main meal in this British dietary system. But a small amount of spaghetti can be used as an addition to the centerpiece in the savory potato course without disturbing the general pattern.

In this dietary system the most distinctive underlying feature appears to be the increasingly clear geometry of forms which is not discernible in the first phases, but which quickly wins out through the temporal sequences, so that we end with complete units structured in such a way as to show in each the pattern that dominates them all. In spite of, or rather perhaps we should say because of the strict austerity of the resources, the sequence of meals forms a single recognizable system: the whole is modelled on the parts and vice-versa. The strong repetitive pattern may reveal the basis of conservatism in the system, and this kind of analysis may be a route that discovers principles of rejection and acceptable innovation in other dietary systems.<sup>1</sup>

Having seen how the pattern of one food system can be described as such, the problems of turning an interest in patterned behavior to good account in the comparison of food systems remains unsolved. To move from the particular case to the general we need to ask different kinds of questions. The general introductory discussion above warns us to look for questions that may help collaboration with nutritionists. We would like to know what sort of social system lets a third of its members go hungry, whether a high degree of variety in the diet is maintained by solitary feeders, whether quantity and ceremoniousness always increase and decrease together as in the British system or whether food tends to be more or less nourishing when it is more developed as a vehicle for religious meanings.

#### Food as Ritual

It is no good supposing that cultural anthropology can produce profound insights into food habits that will be useful to food planners in the world crises of overproduction and famine, without delving very deeply into human behavior and motivation. Food is a part of most important rituals. We cannot neglect the basic principles of understanding rituals of which the first is that rituals do not control people, but rather the other way round. The anthropologist, studying food habits, would be wise not to take a view of ritual as a rigid external constraint. To be alert to the theoretical issues it is best to be open-minded about the whole relation of individual to society. One individual may revel in displays of formality and may manage to raise the standards of celebration for everyone. Another individual may hate formality. In spite of reluctance, he may be dragooned into performing his role in other people's festivities and even into producing his own food in accordance with their expectations. Or a strong personality may persuade his friends to revolt and join him in macrobiotics and the simple life. It is an important sociological issue to consider how much one person is influenced by his fellows, his free choice preempted by them, and how much scope for changing cultural norms lies in the individual's power. If we do not take this as a central question in the anthropology of food, we are apt to suppose that food habits lie as a heavy cultural constraint on individual choice and so to block off all the interesting questions about spontaneous dietary change. There may not be much value in any context for the idea of meaningless ritual which only has an outward hold upon behavior. Do we really believe that a majority in a free community conform to practices to which they do not consent? If there is such a thing as reluctant conformity

is it inevitably a minority consent to majority values? What are the effects on an individual of a general lowering of the level of required conformity? When a community does not censor every detail of how he serves his Sunday lunch, trains his children in table manners, maintains a good cellar, does he keep up his standards spontaneously or does his diet relapse into sameness day after day? Our assumption is that social pressures of a rather competitive sort maintain ritual and dietary standards, but this is an untested bias. According to Durkheim, liberation from community control itself imposes other strains on individual balance of mind, problems to which we can return when we have further explained the idea of intricacy as an approach to the social control and commitment that underly the variety of food habits.

### Complexity of Information

As an approach to this range of problems we offer the concept of intricacy. By intricacy we refer to a particular information-theoretic measure of the amount of structure in a pattern, along the lines suggested by A.N. Kolmogorov (1965). Information theory in mathematics equates complexity in a pattern with information: more complexity is equivalent to more information being incorporated in the pattern. To adapt the mathematical theory to our problem we use the word intricacy to refer to the range of complexity currently being used in a social unit as a mode of response to social cues.

In this usage information appears twice over. Information is in the complexity of patterned behavior which is being studied and also in the conception of social contexts which provide cues for ceremonial enactments. Someone seeing the patterned behavior and knowing the culture is able to read off from it information about the social context. Thus the word intricacy relates two aspects of patterned behavior: one, any act which is a new instance of a pattern (say, setting the table for guests); two, the conceptual models of social life which include earlier enacted series of such patterns. The act is matched to a place in the series by a judgment of relative grades and values, so that it can be assumed to represent a view about its appropriateness, more or less, for a particular type of occasion. We do not call these two aspects signifiers and signifieds, after the practice of French semiotics, because we have reason to avoid the terminology of linguistics. We are directly appraising the (syntactic) amount of information, rather than the (semantic) content. The content is intrinsically non-measurable, but we are not ignoring it, since semantic differences are what enable an ethnographer to distinguish one sign from another.

We should emphasize that intricacy is a multi-level concept, more nearly identifiable with the range of responsive variation at a given level than with either the elaborateness or the exactness of ritual. It is a characteristic of what is the custom over a certain range, and not of any one custom or instance. Our imaginary guest arriving unexpectedly at a wedding in his home was shocked not to be able to recognize it for a wedding. In his experience a proper wedding would be different from other gatherings not by just one or two signs; the whole sequence of the wedding celebration as well as being distinctive should have had more prescribed steps in it. In the old days that he recalled, the complexity

of food served to celebrate a life-cycle event would always be more than that for an annual one. In the sequence of food preparation and food serving, some enactments would be specialized for the wedding or funeral, but also there would be many more steps to perform in either than for the shorter sequences specialized for anniversaries. The difference between the English tea at weekends and at Christmas is a good example. The cues from the social context (however it is understood locally) trigger off full-length or truncated rites. So it is not only the special elements which discriminate each event, but the number of combinations, the number of rules for combining them, the length of the sequences that contribute to the general level of intricacy. It could be described as the bundle of characteristics in behavioral patterns which best parallel the mathematical information-theoretic concept of complexity. At its simplest the latter comes down to the minimum number of instructions that have to be written in a program for the behavioral pattern. In deciding what should enter a well-defined count of the minimum number of rules needed to generate a particular pattern, one might well have to weight some kinds of rules. The work of developing a measure of intricacy involves experiment and decisions as to which outcomes most closely correspond to the ideas of structured behavior currently used in sociology and anthropology. Only then can we say something about how to look at food systems cross-culturally and predict nutritional effects.

It is probably useful now to distinguish this work on intricacy from closely related work in semiology. The late Roland Barthes' magisterial Systeme de la Mode (1967) has been a deeply influential source of ideas and method. Returning to it will be a way of pointing up differences as well as debts. In this book Barthes uses the problem of analyzing a fashion magazine to address the main problems of extending linguistic methods to giving an account of meaning. The first difference between this work and the uses of intricacy measure is that the latter is not primarily intended to relate behavior to speech, it is not intended for a work of translation from one medium to another. This might suggest that most of the questions resolved by Barthes would be irrelevant, but no, they are very illuminating.

### The Analogy With Dress

Barthes takes up de Saussure's distinction between language, a massive, abstract, institutionalized aspect of speaking, and speech itself, a momentary and particular element drawn from language. By a large analogy, fashion, insofar as it deals with dress, corresponds to language. It is a vast, institutionalized, abstract set of concepts; clothing, by contrast, can be used for the individualized physical form of clothing actually worn, corresponding to acts of speech in the fashion journal. The communication going on about dress is infinite. The analysis has to face a problem of selection from an infinity of communications. The principle of selection is to trace changes in the total structure which when they occur automatically entail corresponding changes elsewhere. In the fashion journal two distinct classes of interconnected and interacting statements emerge at once, one in the class of garments described, and the other referring to circumstances in which the clothing will be worn (for example, weekend, sport, office) or to personality features

(for example, which declare a belt or sweater to be young or amusing). He calls this second class of events and personality characteristics "the world" and finds that fashion speech continually relates the clothing to the "world": "For summer evenings, muslin or taffeta," "This sweater for town or country." The words "dress" in the abstract and "world" in the abstract are never referred to as such in the fashion journal. These words are part of a meta-language produced for the requirements of analysis. However, fashion is continually referred to, explicitly or implicitly. Fashion is the abstract concept which stands for an articulated set of principles about how the dress system is supposed to relate to the world system. The speech of fashion refers to particular cases of this articulated relationship, but fashion itself stays as a background concept which can merely assert, yes, that is the fashion; no, it is not the fashion.

An intricacy measure takes for granted some use of the special sources of information that speech itself provides; it is also involved in tracing a relation between particular instances of behavior and the world, such that a change in the one class is accompanied by a change in the other. Though it is intended to make shortcuts through the complications of verbal analysis, we still are faced with the problem of defining a discrete domain of behavior to be analyzed. We also must accept that any such discrete domain that can be reasonably selected owed its discreteness to an immense pool of abstract ideas about an articulated system of relations that ought to hold between behavior in that domain and events in the world. Intricacy analysis depends upon some meta-language concept, such as custom or etiquette, which comprises all these expected and approved articulated relationships between some forms of behavior and the world of events and personalities, and which can say at any one point in time that this is or is not the custom or etiquette. Like fashion and the world in Barthes' model analysis, intricacy theory has to take into account that custom is immaterial and that the world is made up of an infinite amount of abstract elements. The world gets its elements and their discrete boundaries from an intellectual activity that creates categories such as luncheon, garden parties, barbecues, etc.

Barthes notes that in the discrete domain that he has chosen of the fashion magazine, the world and fashion are both infinite and abstract. They cannot be matched completely by elements of dress. There is a kind of equivalence; the dress set does not correspond to the whole of the worldly occasion or personality, or to the whole of fashionable judgment: it is a selection and it appears in the finite concrete form of a particular garment. The clothing is not an equivalent but a particular manifestation of fashion and the world. According to de Saussure's formula the clothing is a sign for the correlation between the abstraction of dress in general and the world and the fashion which it signifies.

By following this strict linguistic usage, Barthes has not completely settled the question of the difference between a manifestation and a sign. If a household recognizes six ways of setting the table, one for family dinner weekdays, one for friends and kinsfolk guests not numbering more than three of the same generation as the host, one for Sundays, one for grandparents' visit, one for a Bishop's visit, with minor differences to show forth permutations and combinations of the above list, it makes no

strain on ordinary language to say that the different table settings can be read as signs of the day of the week and the variations in the attendance list; one can go on and say that the changes on the table signify the events in the world. There are these abstract notions about events in the world, which consist of social categories, and there are these changes on the table which mean those events or which one can say are manifestations of them. It does not, in that example, nor in most purely verbal examples, matter whether the relation is to signify or to manifest, since the arrow of direction points unambiguously from the store of meanings to the selected concrete sign. But there are other cases in which the arrow seems to point the other way, or seems just as intelligibly to point in both ways at once. Roast beef is a sign of Sunday, roast beef means Sunday; Sunday is a sign of roast beef, Sunday means roast beef. When this happens a shift of level is involved: the class of events in the world including the notion of Sunday is superior to and inclusive of the custom which requires roast beef. But such a question does not pose immediate difficulties for the measuring of intricacy because our central approach is not to identify meanings but to make a count of the number of steps required to make manifest events of different orders of magnitude. Whether roast beef is a sign of Sunday or vice versa is not at all at issue for us. Here we have two systems, a calendrical one invested with an infinity of meanings, a food system likewise invested with an infinity of meanings. Both have reference to what Barthes calls the world. The changes in the calendrical system are made physically manifest in many ways, starting with the printed calendar itself, or the sundial or the clock that marks seasons and years, and it is also manifested in social behavior. The measurement of intricacy starts with selecting a class of behavior which makes regular responses to changes in the world. We can side-step the question of which is the signifier of the other. Our task is to select the interacting systems we wish to deal with and specify precisely what elements we are interested in.

### Units of Analysis

Barthes could have been irretrievably bogged down in fashion. He wisely restricts his analysis to the fashion journal. Here he has to distinguish between different levels of writing about clothing, from writing about the fashion's judgment about its response to the world's events (prints triumph at the races, pleats belong to the afternoon, town dress needs touches of white) to different levels of the technology of producing the appropriate clothing. He warns against jumping from one level to another. If there is a group of clothing which comprises hoods, toques, berets, turbans, bonnets, the system of correspondences between fashion this year and fashion last year shows that what makes the toque the right item this year is just that it is not a bonnet or hood or beret. Gloves do not substitute for boots or collars. The variation and substitutions in themselves indicate the groupings. Be careful, he says, not to be distracted by elements in the description which refer to the materials or process of manufacture; keep the levels clear. He writes as if the principles of transformation will automatically give him his groupings, without prior outside knowledge. One suspects that his easy recognition of fashion-meaningful elements is underpinned by a set of pseudo-natural categories which he, as a member of the culture, already

knows. For example, he has been trained for sensitivity to the difference between head-gear and neck-wear. Unlike the archaeologist retrieving them from an ancient tomb, he would never confuse a diamond tiara with a diamond necklace or belt. He is confident about obvious grand decisions between what may be used for the hands, the feet, the waist. He never has to practice the total openness which is necessary for anyone who wants to make parallel analysis of bodily movements in dance styles in which no previous assumptions, even about what parts of the body constitute a unity, are safe. Fortunately, intricacy measurement does not treat the need for this prior ethnographic knowledge as a weakness, but rather requires it explicitly as a necessary starting point. Indeed, the concept of intricacy has to rely upon good ethnography.

Because Barthes works in a limited medium, the printed fashion word, he can make some simple assumptions about identifying the units of analysis and distinguishing levels between them. These assumptions are not so simple and cannot be taken so lightheartedly in analyzing other kinds of domain. But in trying to construct a measure of structuredness or complexity in behavior there are several leaves we can take out of Barthes' book.

For one, we can follow him in ignoring those endless depths of structured behavior which go on for worlds without end. By only taking account of variations in one domain which manifest or correspond to variations in another, we have isolated something restricted out of the whole field of human behavior. Every anthropologist knows that there is no limit to structuredness. The analysis unguarded can easily slide from a wide mesh to finer meshes to even finer ones. The worst offense is to slide unnoticed from one level to another. Mouse bites cheese; mouse is a syllable; therefore a syllable bites cheese (Barthes, 1967:57). Without clear rules for distinguishing levels or for keeping to a given mesh in cross-cultural comparison, the analyst can self-indulgently pick out elements which seem to illustrate his favorite theory. Hence, the low repute of over-mechanical attempts to relate symbols to behavior. Yet how many questions in sociology must await a principle for making a non-arbitrary cut in the subject of structured behavior so that some coherent part can be systematically isolated as a basis for comparison. This concept of intricacy is being developed to avoid the reproach of arbitrary incompleteness in analyzing an inexhaustible source.

Barthes' solutions to making a non-arbitrary selection from the masses of structured behavior is to concentrate only on variations in structure which correspond to variations in social life. Not all patterns, not the solid bedrock mass of patterned behavior, but only the patterns which change in response to changes in the world. Only these are counted which make manifest an event of a particular kind. In most cultures worthy of the name there are hundreds and thousands of rules for deportment which never change. The gentleman who always dresses for dinner even in the jungle camp has many other invariant rules to follow, such as always use a butter knife, never eat peas with your fingers, never point with a fork, never wipe your nose on the tablecloth. However many thousand prescriptions he follows, those prefixed by 'always' or 'never' do not qualify for inclusion in the intricacy measures. But if the normal order of precedence in seating at table is disturbed by the presence of a bishop,

if the gentleman wears a black tie for one kind of dinner and a white tie for another, that counts. We only pay attention to rules which vary behavior according to occasion, so allowing those present to identify the occasion as one of a particular kind.

### Reliance on Ethnography

The crucial matter in cultural comparison is to know how to identify meaningful contexts and meaningful units of behavior. Barthes lets his fashion journal do the first and he thinks his method looks after the second, though we think that his culturally informed judgment has been useful to him. He is not trying to compare one set of responses to another. His objective is completely met when he has demonstrated the relation of different levels of meaning met in one limited domain. Our intention, however, is explicitly comparative. We would at least wish to compare intricacy in food behavior between households recognizing the same culture or between a social unit at one period of time with the same at an earlier period or later. The selection of a cultural domain and the identification of units of analysis become for us central methodological issues. Between two social units the same event in the same world may be given different importance. Between two periods of time one event in that world may wane in significance, one may disappear completely and another one rise up. We cannot guarantee that between different periods or social units the weight of manifesting changes in the world may not first fall upon one medium (say food) and then upon another (say music or clothing). Cultural comparison is bedevilled by this variability, which inhibits attempts to make valid cross-cultural generalizations. Yet, without some method for avoiding these snares, the important questions we started to outline cannot be posed.

We hope that by a shift of problem, some of these difficulties can be avoided. They loom largest when the intentions of the investigator are semiological. But our intentions are not to do with tracing meanings. We do not offer this kind of analysis as a tool for improved ethnography. It is not intended as a way of reaching a more complete, correct idea of the meanings carried in behavior. On the contrary, ethnography is a necessary tool or basic resource on which we heavily rely, and without which we cannot start our comparisons. We need to tap the richest possible knowledge about the local culture before we start to estimate intricacy in food behavior. This best ethnographic background tells us how the world is categorized locally. That is, we expect to know in advance what are locally the main social events and the main social categories and hierarchies. It is not so difficult as might be supposed to then transcend the local definitions and to find a common background to which those of several communities can be matched. For all behavior unfolds in time, and time points can be plottable against a calendar. The ethnographer concerned to assess an intricacy measure for food can list and put in calendrical time most of the important events in a given culture. Other events may not be fixed within an annual calendar, but with good ethnographic preparation one can anticipate and take account of events that are governed by other rules, such as life-cycle or rotational sequences. Again, social categories can be ranked or counted in a variety of ways that hold good across different cultures. They may be subsumed in a count of main

events; they may be ranked by size of following, by kinship, by loyalty or other affiliation. It is not difficult to set up a common system for accounting for all the social categories which are going to be relevant for a particular kind of comparison. We do not pretend that our colleagues arrive with their mind an empty tabula rasa, and then painstakingly build up from scratch an interpretive scheme for the culture. We assume that we have chosen colleagues who know the culture rather well and can quickly put the main events and people in the local world into a common framework.

In 1979-80 some research sponsored by the Russell Sage Foundation<sup>2</sup> among American communities concentrated on developing a measure of structuredness in food and food habits. We focused particularly upon complexity as a form of response to changes in the definition of the social event and changes in the attendance list. The project directors knew already the etiquette or custom by which the world could usually be manifested through variations in preparing and serving food. Food customs, though far from static, are less labile than clothing fashions and we expect some continuity as well as some change from year to year.

Ethnographic knowledge guides us to choose the fields of correspondence between food and events which will be most significant and easy to trace. In this research we concentrated on two fields: food preparation, and food distribution; we were specially concerned to note how these responded to cues from the social environment. A third field called for changes in either food preparation or food distribution, or both, according to established religious or metaphysical views about the world or environment. Here we hoped to compare the load of meaning regularly carried by the food. We could have broken these fields down differently or more finely, we could have included other fields. We did indeed extend the domain we were looking at beyond food to china, cutlery, glass, table linen, lighting, music, anything that the anthropologists in each community knew was a mode of response to social cues. The only important rule for comparison was for the project directors to keep in close communication, so that the kinds of social cues they chose were standardized across the research, so that the social units could be counted on a standardized form, and so that particular elements counted as responses to social cues could also be standardized on a common code.

### Intricacy

Before proceeding we need to say something more about the concept of intricacy itself. To illustrate the idea, space might have many advantages over food since spatial characteristics and traffic flows are essentially measurable. For example, one might risk a conjecture that intricacy tends to be raised when people live together and to be reduced when one is alone. Say for breakfast the wife takes two cups and two saucers from the shelf and puts them on the table, opens the refrigerator, gets out the milk container, puts some milk into the pitcher, returns the rest of the milk to the refrigerator, and walks with the milk pitcher to the table, etc.... On the day the husband gets his own breakfast, he shortens the routine, omits the journeys of the saucer from the shelf to the table, to the sink and back to the shelf, and omits the journey of the pitcher, thus opening and shutting the refrigerator door only once instead of three

times. Her coming back is the signal for intricacy to be restored, if intricacy is the sign that she is back. Movements through space can provide the containing structure for other rule systems. The quasi-choreographic sequence of the movements of the milk and the saucer is easy to describe as a manifestation of a person's presence or absence.

Using the sequential flow of objects through space as case material suggests a characteristic of intricacy that would be less easily seized in another medium. Intricacy does not depend upon available resources. It is counter-intuitive to suppose that the more domestic space that is available, the more it will be subjected to logical subdivisions used to signal particular types of events. On the contrary, the smaller the space, the more we know that we tend to create an intricate classification of its uses. This is very interesting, because if one discussed the concept of intricacy from the point of view of food, it seems to be counter-intuitive to suppose that the availability of resources makes no difference. One naturally imagines, because of the sumptuous fare of the rich and the ease with which they can add a few extra dishes or multiply sauces and drinks, that control over resources is itself a condition for intricacy. But not so: suppose the family with the table cloth signals used 365 table cloths in the year, one for each day, that would not be intricate. Seeing a clean cloth would merely indicate a new day. If a particular color was assigned to each day, so that one could read the table like a calendar, then it would be intricate. Throwing in extra items is not in itself so intricate as the interlocking of a few items with a few others to produce patterns of "if...then" entailments, which also lock into the outside world. There is no reason to suppose that the domestic unit with huge food resources necessarily organizes them more intricately, any more than the rich household will necessarily organize its use of large spaces more intricately than the caravan dweller. The concept of intricacy is independent of economic determination, and only dependent on individual decisions about how much complexity of organization or logical structure is desirable (Gross and Brainerd, 1972). Hence one of its special strengths in cultural analysis is where we specially need measures of behavior that are independent of income or wealth.

As a theoretical example to illustrate the way in which intricacy is independent of wealth, let us suppose that a certain wealthy man has access to the letters A, B, C, D, and E, while his poor neighbor has access only to the letters A and B. If the rich man constructs the pattern

ABCDEABCDEABCDEABCDEABCDE...

while the poor man constructs the pattern

ABAABBAABBBABAABBAABBB...

one might conclude, after a careful examination, that the less well-endowed man has used greater intricacy in his pattern. That it takes a little longer to figure out the poor man's pattern is the intuitive reason behind the conjecture that the poor man's pattern is more complicated.

In this example the rich man repeats the motif ABCDE over and over again, while the poor man reiterates the motif ABAABBAAABBB. If we imagine a computer that would construct these two patterns, its program<sup>2</sup> for the rich man would be as follows:

```

1 Print A
2 Print B
3 Print C
4 Print D
5 Print E
6 Go to rule 1

```

while an obvious program for the poor man might be this:

```

1 Print A
2 Print B
3 Print A
4 Print A
5 Print B
6 Print B
7 Print A
8 Print A
9 Print A
10 Print B
11 Print B
12 Print B
13 Go to rule 1.

```

It is not difficult to prove that the given program for the rich man's pattern is as short as possible, six instructions. When we say the poor man's pattern is more complicated, what we really mean is that the shortest possible program to produce it is longer than six instructions. Even a novice programmer could reduce the length of the program for the poor man's pattern by using loops. However, it would take a significantly more advanced level of mathematical skills to prove that no program of length six or less could possibly produce a poor man's pattern, which happens to be true. Sometimes a simple rule can easily explain an apparently complicated pattern, if only one could guess or somehow infer the rule. Proving that the solution to a problem has a minimum level of complexity is a standard situation, known to be quite difficult in theoretical computer science. After all, just because one person or another cannot find the simple rule does not mean it does not exist.

Although the length of the main motif is often important, it is not the determining factor in the minimum program length. Consider, for instance, a pattern in which the main motif is 300 A's, followed by one B. Despite its length of 301 letters, it has a very short program:

```

1 Do 300 times rule 2
2 Print A
3 Print B
4 Go to rule 1.

```

A food speciality is not thought to be complicated merely because of the preparation time or the cooking time. Stirring steadily is merely tedious, and lengthy cooking requires attention only to the stopping time. The fundamental characteristic of a complicated pattern is a long program of instructions. Thus the motif 300 A's then a B is not complicated, just sort of boring.

Representing a meal pattern by a sequence of letters is no easy task, but it is not behind the skill of a good ethnographer. For instance, Douglas and Nicod (1974) report the following main motif for a particular segment of the British working class' dietary system mentioned above:

ABCBCABBCABBCABBCABBCABBCAB.

In this case, A = dinner, B = secondary meal, and C = tea and biscuits. On Sunday the sub-motif is ABC, and on each of the other six days it is BCAB. The entire pattern is produced by the following program:

```

1 Print A
2 Print B
3 Print C
4 Do 6 times rules 5 to 8
5 Print B
6 Print C
7 Print A
8 Print B
9 Go to rule 1.
```

Our research is not trying to establish absolute levels of structuredness -- mercifully, for that would be an endless task. We are not wishing to compare total amounts of rule-regulated activity as if it could be weighed or piled up and divided in parts. In most cultures a large number of rules require people always to sit just so, hold their knives so, chew in some prescribed way, not to speak with the mouth full, etc. Such background rules are fascinating, but to try to get a full account of them would be pointless. Anthropologists are well aware that there is no way of ever knowing when one has got to the end or of deciding what point of fine detail to stop at. The special merit of our method is to escape that morass. Like Roland Barthes, we only pay attention to rules which vary behavior according to the occasion, and by so doing allow those in attendance to recognize what kind of occasion it is. We are not concerned with the food system with the most rules, but the one most heavily laden with social implication. In London, any cake means Sunday tea, a rich curranty spiced cake covered with yellow marzipan means Easter Sunday tea; the same with white and red frosting means Christmas Sunday tea; the same presented in pastel colors with candles means a birthday; in three tiers in pure white frosting with silver bows and bells, means a wedding; and the top tier of the latter presented a year later means a christening.

For food to say very much, it would have to be organized by minutely discriminated prescriptions. Variations in intricacy would be apparent in the kitchen and in the shopping lists. It calls for advance planning and division of labor. We do not suppose that less intricacy calls for

less work, but we do expect that intricacy calls for work of a certain kind, which will only be forthcoming if there is some consensus about the meanings that could be conveyed along such channels and some rewards of shared understanding through a long gamut of nuanced variations. Of course, intricate sequences use time, but they save decision-making at every instant of time, preventing the confusion and loss of communication that ambiguity entails. On the other hand, the ambiguity may be a cost worth incurring for the sake of extra flexibility in conditions of crisis and general uncertainty.

An intricate system is a store of meanings, like the stored-up classificatory work that is represented at its visible tip by the library catalogue. It has the prearranged power and precision of tramlines with their switches. With a measure of intricacy, we could ask and test whether a highly intricate system of behavior is more stable than a less intricate one: supposedly, the structured store of meanings is a source of resistance to sweeping change. On the other hand, it may permit more day-to-day variety, because it rises above the personal tastes of the autocrats of fashion. Conceivably, an intricate system may also employ less severe sanctions against deviation, because appropriate responses to misbehavior are built into the system, rendering misbehavior less threatening.

### Components of Intricacy

We have introduced this measure with the hope that it may prove useful for posing new questions in the social sciences and giving new answers to old questions. Much interesting comparison has been based upon concepts such as structuredness or flexibility of particular areas of behavior, such as the flexibility of family structure, loose or tight structures of authority, concepts which are intuitively intelligible, but which need firm anchorage if the comparisons are to be more than impressionistic.

Three project directors who are collaborating in developing this method are engaged in fieldwork in different communities in the United States. They and their research teams are spending four weeks in each of the household units they are studying and are sharing the food. They each know the ethnographic background of the community in question, and have prepared typologies of the major classes of food-taking, from solitary snacks to all the local feast days and celebrations. For every occasion they check the actual attendance against the expectations of the persons responsible for the food. For every meal they record on code sheets what was served and how it was served, to provide comparable information about the quantity variations and variations in intricacy.

Not expecting to cover all aspects of intricacy, we have distinguished three components in which we were specially interested. The main component of intricacy which we have focused upon we have called distributive. It comprises all the responses to the demand for more ceremoniousness that take the form of rules of distribution: who serves, what spatial relationships hold among participants, what precedence is observed, the course structure, rules for first, second, third helpings, if any. If these

are general background rules which do not vary from one occasion to another, they do not score for distributive intricacy. Only if distribution is different when the occasion varies does it convey differentiated social meanings, and so count in the intricacy comparison. The second component could be termed aesthetic intricacy. This would refer to the sensory standards to be met by a presentation of food: how the food should look as to colors and shapes, how hot or cold it should be, how solid or liquid or crumbly, how it should taste, salty, spicy, sweet, bland, and so on. It would not be difficult to keep a researcher in the kitchen, recording the working out of all the recipes. This would provide information on all the steps necessary to produce the final result that arrives on the table. However, we have not had time or resources to work out a satisfactory test of intricacy in this prime aspect of gastronomy. Instead we are getting rough approximations by noting the combinations of elements which the food system allows and noting whether these combinations become more complex to indicate social meanings. For instance, in some of the southern States at least two kinds of roast meat are required to mark the difference between a feast and an ordinary occasion. Then we analyze shopping lists, make equipment counts, ingredient inventories to give the background to comparisons. We know that it would be possible to get a much better idea of aesthetic forms of ceremoniousness if more time and staff were available, but we have had to satisfy ourselves with a measure of what could more appropriately be called preparatory intricacy.

The last component of intricacy we have called metaphysical. Anthropologists are particularly alert to the symbolic implications of food. To have concentrated research on comparing the intricacy of steps used to reach a set of sensory requirements in food, and the intricacy of steps used for controlling the distribution of the food without trying to devise any agreed basis for comparing the weight of religious symbolism laid upon the food, would be to lose an opportunity for a specifically anthropological type of research. Christianity started by requiring less prescription about ritual and non-ritual foods, clean and unclean kinds of food or utensils, than ancient Judaism. Modern Hinduism has more prescriptions on these topics (cf. Khare, 1976) than either Christianity or ancient Judaism, while among adherents to modern Judaism the number of prescriptions concerning food will vary. It ought to be easy to compare so that field reports would show how much or how little the everyday act of consuming food is incorporated into the doctrinal and ritual framework. One might then be able to test some common predictions and assumptions about the stability and persistence of religious belief. How does a minority immigrant group keep up its religious practice if unable to obtain the religiously prescribed foods? Would a religion which does not minutely prescribe food rules have a proselytizing advantage? Does a religion maintained by recruitment to a specialized priestly order suffer more the temptations and abuse of religious power than one organized as "a nation of priests," each family head the recognized representative of the deity, each meal a ritual? Does strict religious prescription keep poor people poor, do the poor find more order and meaning in their lives than the rich? Some of these general questions about the religious context of food-taking pertain to the general question of anomy and regulation.

While devising a measure for these matters, there is no need for the anthropology of food to be restricted to dogmatic religion. We can extend the enquiry beyond religious meanings in a normal sense, to include any metaphysical discourse that entails reflection on the ultimate principles of the universe, on death, fate and the human predicament. Since our interest is in the symbolic uses of food, we can include cosmological, moral, and political principles alongside with religious. A measure of the metaphysical aspects of food would include every requirement to reflect upon or comment on the ideals, origins and history of the group partaking of food together, its political history and current political relations, threats to its common prosperity or opportunities for fulfilling its destiny. Such a wide definition makes the comparison across cultures more interesting, for though we could easily report on cultures with no dogmatic religion, we could hardly meet one lacking in any metaphysical ideas whatever.

We expect that aesthetic and distributive intricacy will be closely correlated. It is not plausible that anyone would go to the trouble of imposing special rules of precedence for particular occasions when food is taken, without also requiring differences in the food itself. We do not know what to expect of the measure of metaphysical strength. By focusing on three components of structure connected with food we have avoided a linear form for the results of the comparison. Some of our research subjects will put more metaphysical meaning into their food and less preparatory intricacy.

### Consistency of Behavior

When all this work is done, what use can it serve in the broad discussions of structuredness in social behavior? If we find wildly veering scores for intricacy in a particular component, say distribution, among the household units in one so-called culture, we might have to conclude that intricacy does not help to identify something about a culture and so gives no help in cross-cultural comparison. This would be very disappointing. It would also be counter-intuitive. According to the anthropological tradition which treats ceremonial practices as a vehicle for meaning, rich meanings would not be freshly invented with each new recipe or baking day. They have to have some currency to be understood at all. To settle these questions we have added a hypothesis about consistent behavior.

We do not expect to find wildly veering scores for intricacy in the different aspects of social life for a given social unit. Take, for example, two households exposed to the same advertisements and television and the same principles of neighborly hospitality. Each social unit can be said to be in the same general cultural milieu. Taking food as the domain, we expect that if one outranks the other in the intricacy of workday meals, then it will also outrank the other in the intricacy of Sunday dinner and special occasions, such as Thanksgiving, and 4th of July. In each social unit we expect that the range of responsive variation to outside clues will be consistent: If the intricacy of food changes, so, we expect, will dress, space, singing, speech. If this can be empirically demonstrated, a great advance will be made in comparison of

social behavior. For in future it will not be necessary to take very large samples or make large numbers of observations. A law of relative intricacy could be developed for more economical predictions. The hypothesis of behavioral consistency is based on an assumption about relations between any one social unit and the rest of the world that it interacts with. Intricacy is a form of responsiveness to the social values and norms of the larger society. No one would argue that all sub-units are equally responsive; some are demonstrably isolated, whether by intention or default. Likewise, a sub-unit which shows strong cultural linkage in one medium of social relations (such as food) is likely to be responsive to social cues in the other social media normally used in that culture.

If one commensal group from a given culture outranks another from the same culture in distribution intricacy at one kind of food event, then it is expected also to outrank the other at the other kind of food events; the same holds good for preparatory intricacy.

### Social Predictability

We also have a general hypothesis about the way that regular membership of a commensal unit will affect intricacy. We need to develop something like a social predictability score. Taking the social network of persons fed through the year from a normal kitchen, the more the attendance list can be precisely predicted from one type of occasion to another, the higher the score for social predictability. We expect that if social predictability is low, intricacy will be low too. When a mother never knows how many friends her children will bring home or whether they will even come home for dinner themselves, she will scarcely trouble to create elaborate menus. This is not a good example, because children's food tends anyway to have low intricacy because of their low social status, regardless of their predictable arrival at mealtimes. We expect that conventional children's food, the food of solitary eaters, and the food for the hospitable reception of the largest numbers of unpredictable guests will generally show the lowest scores for intricacy for different reasons.

In some cultures sheer numbers expected can generate a rough and ready typology of celebrations. There is usually an inverse relation between numbers and frequency of the event. If this holds, the scale of social predictability starts with the fewest persons present, which tends to coincide with the highest frequency of the event. In some households breakfast may be taken every day, with only one or two persons sharing it. Starting from such a starting point, each culture would provide its own most appropriate scaling of intervals based on increasing numbers and declining frequency, ending, say, with funerals and golden jubilees. Some cultures will rate a high score for social predictability. We would try to compare this with the intricacy of the food system. For an index of social predictability we are suggesting the ratio of the absolute observed variation to the number of persons expected to be present at a specified event. Thus, the index value zero means perfect predictability, and high values means less predictability. One expects that highly unpredictable events on this index tend to have highly unpredictable quantities per person and low intricacy. On these lines we are able to

suggest a number of social factors correlated with intricacy in the food system, and to look for physiological consequences of intricacy variation.

All the main hypotheses depend on finding a workable measure of social responsiveness in the food system. We have tried to adapt from computer science a measure delicate enough to record differences consistent with the scale of human behavior. The method developed in the research sponsored by the Russell Sage Foundation quantifies the information content of the patterns that different cultures present by variations in food and variations in context in which food is presented.

The creation of an intricate system has its own costs. We have a hypothesis concerning the relation between intricacy and other costs. Some of the significance of a special occasion can be shown by elaboration and some by varying the quantities of food. Quantity and intricacy are both limited by constraints of time and cash. A decision to make a social event important by piling on great quantities of food will presumably set a limit on the resources available for higher intricacy. We expect that the amount of quantity variation and the amount of intricacy variation are inversely related, and that they are alternatives appropriate to different features of social organization. Individual competitive social systems are more likely to be eclectic, innovatory, fashion-conscious, more tolerant of ambiguity, all characteristics which go counter to intricacy. Such cultures are likely to use food and hospitality in their competitive social relations and so there will be a pressure to mark the importance of occasions with food. If the marking is done without intricacy, the importance will show in the costliness and quantity of food. Intricate food patterns will be easier to achieve when a complex division of labor facilitates the integrated performance of different tasks. At the same time, those organically stratified and divided social systems which keep competition under control are those that can use the precise, unambiguous distinctions afforded by an intricate food system.

These reflections suggest several new reasons why an intricacy measure for food may be worth pursuing. Naturally one expects the culture that favors changes in the quantity of food as a way of responding to social cues will incur problems of obesity among those of its population whose successes have to be continuously celebrated. On the other hand, in those same cultures, since not everybody can win, there will be a majority who cannot give so lavishly and whose presence at the celebration of the others does not rate a big response. Conscious of relative failure, they may tend to be depressed and worried. Following William Shack's description of the Ethiopian Gurage people (1966, 1971) where something very like nervous self-starvation appears as a regularly instituted illness, we suggest sociological as well as psychological predispositions to anorexia nervosa in the cultures that celebrate by changes in quantity more than by changes in intricacy.<sup>3</sup>

### Training the Palate

Further hypotheses about the trained discrimination of the sense of taste can also depend upon the distinction between quantity and intricacy responses. It seems likely that being reared in a domestic unit that

achieves a high degree of intricacy in food preparation and presentation, is a condition for a highly-trained palate, sensitive to minute variations in flavor and easily revolted by unaccustomed combinations. If the converse holds, the low intricacy food system would prepare its members to be more readily omnivorous and more adaptable to new foods.

Another hypothesis is that no food system will be homogeneous throughout. In respect of intricacy, any food system is likely to have some more highly structured or ceremonial parts, and others less. We suppose that in its relatively intricate (ceremonial) areas, the food system would be most conservative and resistant to innovation. This would be because minute taste differences in the ceremonial foods would be perceived as violations of the system; accordingly, sensitivity to them comes to reinforce the structure. If this is so, new elements in diet will not be acceptable when introduced into the ceremonial parts of the food system because of minute differences detected in the taste, but they will be acceptable in the less structured parts. Several implications for health and nutrition follow.

### Conclusion

This approach should serve to direct the thoughts of welfare agencies away from measuring the material condition of poverty and turn them towards measures of social integration and social isolation. Households with the same money income can use it for linking themselves more closely into the flow of social life, or in ways that isolate them from it. Intricacy research should reveal which categories of the low-income population are likely to retrieve a better situation later and those which will be more disadvantaged for lack of strong social linkage. We should also consider whether reduction in intricacy is not a good strategy for survival for households on the margins of the economy, giving them flexibility in use of resources. We assume that intricacy will be lower in periods of social change, but perhaps that is a trivial assumption, since intricacy being reduced somewhere is a direct description of a major aspect of any social change. As soon as the people withdraw their consent to the values and communications that the intricate system can convey, the work entailed in elaborately constructed sequences of food and related paraphernalia must seem unnecessary and even wasteful, perhaps immoral. They will quickly fall into desuetude, more quickly than the time it takes to build them up.

Mary Douglas  
Jonathan Gross

Mary Douglas is currently a Research Scholar at the Russell Sage Foundation, New York, and Co-Chairman with R.S. Khare of the International Commission on the Anthropology of Food. Jonathan Gross has current research interests in combinational modeling and in topological graph theory. He is Professor of Computer Science, of Mathematical Statistics and of Mathematics at Columbia University, New York.

## NOTES

1. Most of the above description (and the four tables) is reproduced verbatim from Nicod (n.d.) and appeared in the Russell Sage Foundation's Annual Report for 1977.
2. The Russell Sage Foundation sponsored this anthropological research on food patterns in selected North American communities in 1979-80. (See Annual report, 1979).
3. See Douglas (1977).

## BIBLIOGRAPHY

- Barthes, R. 1967. Le Système de la Mode. Le Seuil, Paris.
- Douglas, M. 1977. Introduction to The Anthropologists' Cookbook. New York.
- \_\_\_\_\_ & Nicod, M. 1974. 'Taking the Biscuit: The Structure of British Meals', in New Society Vol. 30 no. 637 pp. 744-7.
- Gross, J.G. & Brainerd, W.S. 1972. Fundamental Programming Concepts. Harper & Row, New York.
- Khare, R.S. 1976. The Hindu Hearth and Home. Carolina Academic Press.
- Kolmogorov, A.N. 1965. 'Three approaches to the quantitative definition of information', in Russian, Problemy Peredachi Informatsii I. pp. 3-11.
- Nicod, M. (n.d.) 'A Method of Eliciting the Social Meaning of Food'. Report to the Department of Health and Social Security. Unpublished M. Phil. Thesis, London.
- Russell Sage Foundation. 1977. Annual Report, Culture.
- \_\_\_\_\_. 1979. Annual Report.
- Shack, W. 1966. The Gurage: A People of Ensete Culture. Oxford.
- \_\_\_\_\_. 1971. 'Hunger, Anxiety and Ritual: Deprivation and Spirit Possession Among the Gurage of Ethiopia', in Man 7(1):30-43.
- (Williams, D. 1978. 'Sacred Spaces: A Preliminary Enquiry into the Latin High Mass'; paper for Canadian Sociology and Anthropology Association Conference, May)

APPENDIX

TABLE I

Structural Elements in Main Meal

Meal A

Food in Course 2 repeats structure of Course 1 in different materials.

	<u>Mode</u>	<u>Structure</u>	<u>Elements</u>
Course 1	hot savory	staple	potato
		center	meat, fish, egg with green vegetable, stuffing, Yorkshire pudding
		dressing	thick brown gravy
-----			
Course 2	hot or cold sweet	staple	cereal
		center	fruit
		dressing	liquid custard or cream

TABLE II

Overall Pattern in Main Meal

Meal A

Varieties reveal an overall pattern.

<u>Course 1</u>	<u>Course 2</u>	<u>Course 3</u>
savory	sweet	sweet
potato staple	cereal staple	cereal staple
no discretion to omit elements	some discretion	optional
dressing runny	dressing thick	dressing solid
other sensory qualities of food dominate over visual pattern	visual pattern dominates until serving	visual pattern dominates until eating
solids not segregated from liquids		solids and liquids segregated
start hot	optionally hot or cold	cold

TABLE III

Correspondence Between First and Second Meals

Meal B

Meal B repeats meal A in course sequence but keeps to the staple of Course 2.

	<u>Mode</u>	<u>Structure</u>	<u>Elements</u>
Course 1	savory, hot or cold	staple center dressing	bread meat, fish or egg or baked beans butter
Course 2	sweet, cold	staple center dressing	bread jam butter
Course 3	sweet, cold		optional cake for Sundays or sweetbiscuits*

---

\*This word has a special meaning in England. It cuts the spectrum which runs between cake-to-cracker and the spectrum of desserts in a distinctive way. Sweet biscuits are small, dry, smooth confections, presented in highly contrived, regular geometric shapes.

---

TABLE IV

Pattern for First and Second Meals

Rules controlling relation of meal A to meal B bring both under a single pattern.

---

Between meal A and meal B through courses one, two, and three, the following rules hold:

- a) increasing dessication
- b) increasing dominance of visual pattern
- c) decreasing scale of quantity
- d) nonreversibility:
  - i) of staple order
  - ii) of savory/sweet order
  - iii) of dessication order
  - iv) of scale order
  - v) of hot to cold order