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ANTHROPOLOGY AND PSYCHOLOGY: TOWARDS AN EPIDEMIOLOGY OF REPRESENTATIONS*

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Cultural things, it is argued, are distributions of representations in a human population, ecological patterns of psychological things. To explain cultural phenomena is, then, to develop an epidemiology of representations. For this, representations have to be viewed not as abstract, but as concrete objects which can be of two forms: they are either mental representations inside brains, or public representations in the environment of brains. Just as an epidemiology of diseases has to be rooted in individual pathology, an epidemiology of representations has to be rooted in cognitive psychology. Drawing on a distinction between dispositions and susceptibilities, the relevance of this epidemiological approach to several domains of anthropological research (folk concepts, religious beliefs, oral narratives and institutions) is briefly discussed.

When Malinowski was a student, anthropology and psychology were each well-integrated domains of research. Anthropologists or psychologists could have a command of their whole field. Indeed, many of them, Rivers, Wundt and Malinowski himself for instance, had a command of both fields. Three-quarters of a century later, the situation is quite different: anthropology and psychology are no longer domains of research, but families of such domains, institutional associations of loosely related enterprises. To put it bluntly, 'anthropology' and 'psychology' are less the names of two sciences than of two kinds of university departments.

Anthropologists and psychologists occasionally show interest in each other's work, argue or co-operate. I do not propose to review these sundry interactions; others have done it much better than I could.¹ What I should like to consider today is the relationship between a central concern of anthropology, the causal explanation of cultural facts, and a central concern of psychology, the study of conceptual thought processes. In spite of their centrality, neither the explanation of cultural facts, nor the psychology of thought are well-developed domains. They are, rather, at a programmatic or, at best, exploratory stage. So, perforce, must be a discussion of their relationship.

Malinowski maintained that cultural facts are partly to be explained in psychological terms. This view has often been met with scepticism or even scorn, as if it were an easily exposed naive fallacy. What I find fallacious are the arguments usually levelled against this view. What I find naive is the belief that human mental abilities make culture possible and yet do not in any way determine its content and organisation.

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The question is not whether psychological explanations of cultural facts are, in principle, admissible; the question is which psychological considerations are, in effect, explanatory. In this respect, the view I would like to defend contrasts with that of Malinowski. He laid emphasis on the psychology of emotions; I, on the psychology of cognition.² He saw some cultural representations as based on psychological dispositions and as answering psychological needs (just as he saw other aspects of culture as answering biological needs). I believe that, more important than needs, and at least as important as dispositions, is a psychological *susceptibility* to culture.

Epidemiology

The human mind is susceptible to cultural representations, in the way the human organism is susceptible to diseases. Of course, diseases are, by definition, harmful, whereas cultural representations are not. Do you believe, though, that every cultural representation is useful, functional or adaptive? I do not. Some representations are useful, some are harmful; most, I guess, have no outstanding beneficial or detrimental effects on the welfare of the individual, the group or the species—not the kind of effects which would provide us with an explanation.

What is it, anyway, that we want to explain? Consider a human group. That group hosts a much larger population of representations. Some of these representations are entertained by only one individual for but a few seconds. Other representations inhabit the whole group over several generations. Between these two extremes, one finds representations with narrower or wider distributions. Widely distributed, long-lasting representations are what we are primarily referring to when we talk of culture. There exists, however, no threshold, no boundary with cultural representations on one side, and individual ones on the other. Representations are more or less widely and lastingly distributed, and hence more or less cultural. So, to explain culture is to answer the following question: why are some representations more successful in a human population, more contagious, more ‘catching’ than others? And, in order to answer this question, the distribution of representations in general has to be considered.

I see, then, the causal explanation of cultural facts as necessarily embedded in a kind of *epidemiology of representations*.³ There are, to begin with, some obvious superficial similarities. For instance, a representation can be cultural in different ways: some are slowly transmitted over generations; they are what we call traditions and are comparable to endemics; other representations, typical of modern cultures, spread rapidly throughout a whole population but have a short life-span; they are what we call fashions and are comparable to epidemics.

Epidemiologists have constructed sophisticated mathematical models of the transmission of diseases and it is tempting to try and apply them to various forms of cultural transmission. This is the line taken by Cavalli-Sforza and Feldman (1981). While their work is worth paying attention to, especially given the dearth of explanatory models in the study of culture, they underestimate important differences between the transmission of diseases and cultural trans-

mission. At the same time, they fail to appreciate deeper similarities between the epidemiology of diseases and that of representations.

The transmission of infectious diseases is characterised by processes of replication of viruses or bacteria. Only occasionally do you get a mutation instead of a replication. Standard epidemiological models picture the transmission of stable diseases, or of diseases with limited and foreseeable variations. Representations, on the other hand, tend to be transformed each time they are transmitted. For instance, your understanding of what I am saying is not a reproduction in your minds of my thoughts, but the construction of thoughts of your own more or less closely related to mine. The replication, or reproduction of a representation, if it ever occurs, is an exception. So, an epidemiology of representations is first and foremost a study of their transformations; it considers the reproduction of representations as a limiting case of transformation.

Epidemiology of diseases occasionally has to explain why some diseases are transformed in the process of transmission. Epidemiology of representations, on the contrary, has to explain why some representations remain relatively stable, i.e. why some representations become properly cultural. As a result, if and when we need mathematical models of cultural transmission, I doubt that we can borrow or easily adapt standard epidemiological models. Similar comments would apply to other biological models of culture such as those put forward by Dawkins (1976) or Lumsden and Wilson (1981).

It is possible, though, to pursue the epidemiological analogy in a different and more relevant direction. Epidemiology is not an independent science studying an autonomous level of reality. Epidemiology studies the distribution of diseases; diseases are characterised by pathology. The distribution of diseases cannot be explained without taking into account the manner in which they affect the organism, that is, without looking at individual pathology and, more generally, at individual biology. Conversely, epidemiology is a major source of evidence and suggestion for pathology.

What pathology is to epidemiology of diseases, psychology of thought should be to epidemiology of representations: I expect the epidemiology of representations, and therefore the causal explanation of cultural facts, on the one hand, and the psychology of thought on the other, to stand in a relationship of partial interpenetration and mutual relevance.

Most discussions of the relationship between anthropology and psychology, at the theoretical level we are presently considering, have been in terms of reductionism versus anti-reductionism, as if these were truly available alternatives, and the only available alternatives at that. For reductionists, cultural facts are psychological facts to be explained in psychological terms; for anti-reductionists, cultural facts belong to an autonomous level of reality and have to be explained essentially in terms of one another. I believe that neither reductionism nor anti-reductionism make much sense in this case, and that the epidemiological analogy provides a more plausible approach.

The notion of the reduction of one *theory* to another is fairly well understood; it is illustrated by famous cases such as the reduction of thermodynamics to statistical mechanics (see Nagel 1961: ch. 11).

The notion of the reduction of one field of inquiry to another, such as the

reduction of anthropology to psychology, is much vaguer, and particularly so when neither field is characterised by a well established theory. In such cases, assertions to the effect that one field can, or cannot, be reduced to the other are generally based on *a priori* convictions rather than on specific arguments; some people believe in the Unity of Science, others believe in Emergent Evolution. Relationships between fields are, however, too varied and subtle to be analysed solely or even primarily in terms of reduction or non-reduction.⁴

Epidemiology, for instance, is the ecological study of pathological phenomena. It is as eclectic in its ontology as ecology is. It has no more ontological autonomy than ecology has. It does not reduce to pathology and yet it cannot be defined or developed independently of pathology. Of course, one could have an epidemiology of good health or of any other condition, or, as I am suggesting, one can have an epidemiology of representations. But whatever 'epidemiology' one is considering, it has to be defined in relationship to some sister discipline.

What I want to suggest with the epidemiological analogy is that psychology is necessary but not sufficient for the characterisation and the explanation of cultural phenomena. Cultural phenomena are ecological patterns of psychological phenomena. They do not pertain to an autonomous level of reality, as anti-reductionists would have it, nor do they merely belong to psychology as reductionists would have it.⁵

The epidemiological analogy is appropriate in yet another way. The distribution of different diseases, say malaria, lung cancer, and thalassaemia, follows different patterns and falls under quite different explanations. So, while there is a general epidemiological approach characterised by specific questions, procedures and tools, there is no such a thing as a general theory of epidemiology. Each type of disease calls for an *ad hoc* theory, and though analogies are frequent and suggestive, there is no principled limitation on how much different cases might differ. Similarly, the project of a general theory of culture seems to me misguided. Different cultural phenomena, say funerary rituals, myths, pottery and colour classifications, might well fall under quite different explanatory models. What the epidemiological analogy suggests is a general approach, types of questions to ask, ways of constructing concepts, and a plurality of not too grand theoretical aims.

Representations

The notion of representation is often used in studies of culture, but ever since Durkheim's 'collective representations' it has been left in a kind of ontological haze. This will not do if we seriously want to develop an epidemiology of representations. A representation involves a relationship between three terms: an object is a representation *of* something, *for* some information processing device. Here, we shall only consider representations *for* human individuals, ignoring other information processing devices, such as telephones and computers, even though they affect the distribution of representations in human populations. We shall consider representations *of* anything we please: of the environment, of fictions, of actions, representations of representations, etc., ignoring the difficult philosophical problems this raises.

The issue we cannot ignore is this: what kinds of objects are we talking about when we speak of representations? We can talk of representations as concrete, physical objects located in time and space. At this concrete level, we must distinguish two kinds of representations: there are representations internal to the information processing device, i.e. *mental representations*; and there are representations external to the device and which the device can process as inputs, i.e. *public representations*.

Take for instance the Mornay sauce recipe in a cookbook. It is a public representation, in this case an ink-pattern on a piece of paper which can be read, i.e. processed as an input of a certain kind. The reader will form a mental representation of the recipe, which he can then remember, forget or transform, and which he can also follow, i.e. convert into bodily behaviour. Or take a mother telling her daughter the story of Little Red Riding Hood. We have there a public representation, in this case a sound pattern which causes the child to construct a mental representation, which she may remember, forget, transform and tell in her turn, i.e. convert into bodily, and more specifically vocal, behaviour. At this concrete level, there are millions of tokens of the Mornay sauce recipe, millions of tokens of Little Red Riding Hood, millions, that is, of both public and mental representations.

An epidemiology of representations is a study of the causal chains in which these mental and public representations are involved: the construction or retrieval of mental representations may cause individuals to modify their physical environment, for instance to produce a public representation. These modifications of the environment may cause other individuals to construct mental representations of their own; these new representations may be stored and later retrieved, and, in turn, cause the individuals who hold them to modify the environment, and so on.

There are, then, two classes of processes relevant to an epidemiology of representations: intra-subjective processes of thought and memory, and inter-subjective processes whereby the representations of one subject affect those of other subjects through modifications of their common physical environment. Intra-subjective processes are purely psychological. Inter-subjective processes have to do with the input and output of the brain, that is, with the interface between the brain and its environment; they are partly psychological, partly ecological.

Representations can also be considered at a purely abstract level, without referring either to their mental form in human brains or to their public form in perceptible physical patterns. At this abstract level, formal properties of representations can be discussed: we may notice that the Mornay sauce recipe contains that of Bechamel sauce, and discuss it as an example of French Bourgeois Cuisine—another abstraction. We can analyse the plot of Little Red Riding Hood, compare it to that of other tales, and try to argue, in a Lévi-Straussian fashion, that Little Red Riding Hood stands in relationship of symmetrical inversion with, say, Jack and the Beanstalk.

As abstract objects, representations have formal properties and enter into formal relations among themselves. On the other hand, abstract objects do not directly enter into causal relations. What caused your indigestion was not the

Mornay sauce recipe in the abstract, but your host having read a public representation, having formed a mental representation, and having followed it with greater or lesser success. What caused the child's enjoyable fear was not the story of Little Red Riding Hood in the abstract, but her understanding of her mother's words. More to the present point, what caused the Mornay sauce recipe or the story of Little Red Riding Hood to become cultural representations is not, or rather is not directly, their formal properties, it is the construction of millions of mental representations causally linked by millions of public representations.

There is a relationship between these concrete processes and the formal properties of the representations processed. Formal properties of representations can be considered in two way (which are not incompatible): as properties of abstract objects considered in themselves (a Platonist approach); or as properties that a processing device, a human mind in particular, could attribute to them and exploit (a psychological approach). In other terms, formal properties of representations (or at least some of them) can be considered as *potential psychological properties*. Potential psychological properties are relevant to an epidemiology of representations. One can ask, for instance, what formal properties make Little Red Riding Hood more easily comprehended and remembered—and therefore more likely to become cultural—than, say, a short account of what happened today on the Stock Exchange.

The Platonist approach may be of great intrinsic interest,⁶ but it is not the appropriate one if one is interested in providing a causal explanation of cultural facts. Both mental and public representations have to be considered, and formal properties have to be seen in psychological terms.

Misconceptions

Most discussions of cultural representations, whether in anthropology, in studies of religion or in the history of ideas, consider them in abstract terms: a myth, a religious doctrine, a ritual instruction, a legal rule or even a technique, is discussed without any consideration of the psychological processes it may undergo or of the interplay of its mental and public representations.

Even self-proclaimed materialists discuss representations without consideration of their material existence as psychological stimuli, processes and states. The difference between self-proclaimed materialists and those whom they accuse of idealism is that 'materialists' see representations more as *effects* of material conditions, while 'idealists' see them more as *causes* of material conditions. Both 'materialists' and 'idealists' talk of representations considered in the abstract as entering into causal relationships with the material world; whatever the order of causes and effects favoured, this presupposes a very unsound form of idealistic ontology.

It is conceivable, of course, that causal explanations of cultural facts could be formulated at a fairly abstract level, ignoring thereby the micro-mechanisms of cognition and communication. This is certainly what anthropologists and sociologists have tried to do, linking, for instance economic infrastructure and religion. However good it might be, any such explanation would be incom-

plete. For economic infrastructure to affect religion, it must affect human minds. There are only two ways, one cognitive, the other non-cognitive, in which human minds can be affected. The mind can be affected by stimuli, i.e. by very specific modifications of the brain's physical environment. Or the mind can be affected through non-cognitive physical and, in particular, chemical modification of the brain resulting from, say, nutritional deficiency or electroshock. To show that economic conditions affect religion, one must be capable of showing how economic conditions act on the interaction of brains and environments in either a cognitive or a non-cognitive way. Moreover, this action must be shown to cause the cognitive and behavioural modifications which, at a more abstract level, are described as religion.

For the time being, we have neither convincing general explanations of cultural facts at an abstract level, nor an epidemiology of representations. The question is, therefore, how should we allocate our efforts? Of course, it is a good thing that we each follow our different hunches and that we do not all give the same answer to that question. In arguing for an epidemiology of representations, I do not want to turn all anthropologists into epidemiologists; I merely want to raise an interest in this alternative approach.

Imagine that a successful explanation of cultural phenomena is possible at an abstract level. It would at best be incomplete. It could not replace an epidemiology of representations solidly rooted in psychology, which would have to be developed anyhow. Imagine, now a successful epidemiology of representations. Of course, for all we know, it might provide only incomplete or needlessly cumbersome explanations of cultural facts. But there is also the possibility that it would encompass all the explanations we need. An epidemiology of representations is certainly necessary, and possibly sufficient, for the causal explanation of cultural facts. I see that as a strong reason to develop the epidemiological approach.

I do not hope, by that argument, to convince anthropologists and sociologists who are quite content to remain at an abstract level and ignore psychological issues. Their attitude is, I guess, less based on a misconceived ontology than on a misconceived psychology. They might grant that culture has to be psychologically implemented and yet maintain that the human mind is such that this implementation is easily achieved and does not affect the contents of culture.

In most of the literature, intra- and inter-subjective processes are assumed, either implicitly or explicitly, to ensure, on the whole, the simple and easy circulation of just any conceivable representation. The possibility that human cognitive and communicative abilities might work better on some representations than on others is generally ignored. The transformations caused by storage and recall are rarely taken into account: it is as if recall were a mere reversal of the effects of storage. Similarly, inter-subjective processes are taken to consist in straightforward imitation, or in the automatic encoding and decoding of representations. If these assumptions were correct, the causal micro-mechanisms of the transmission of representations would be of marginal relevance only; any representation could flow unaltered through the channels of social communication, with just a smooth oscillation between indefinitely repeated mental and public forms. An epidemiology of representations would

deal with trivial matters. Nothing irretrievable would be lost, then, in considering cultural representations in purely abstract terms. However, spelling out these psychological assumptions is enough to show that they are utterly naive.

Without even turning to scholarly psychology, each of us knows by personal experience that some representations, say Gödel's proof, are very hard to comprehend, however much we would like to; some representations, say a figure of twenty digits, though not hard to comprehend, are hard to remember; some deeply personal representations are hard or even impossible to convey without loss and distortion; on the other hand there are some representations, say the story of Little Red Riding Hood or a popular tune, which we cannot help remembering, even though we might wish to forget them.

What is it that makes some representations harder to internalise, remember or externalise than others? We might be tempted to answer, 'their complexity', and to understand 'complexity' as an abstract property of representations. This answer will not do. A figure of twenty digits is not more complex than the story of Little Red Riding Hood; any standard computer can process the former much more easily and with much less memory space than the latter. In fact, while it is easy enough to provide a computer with the *text* of a version of Little Red Riding Hood, it is not clear how we could provide it with the *story* itself. Human beings, on the other hand, remember a story much more easily than a text. So, what is complex for a human brain differs from what is complex for a computer; complexity is not an explanation, but something to be explained. What makes some representations harder to internalise, remember or externalise than others, what makes them, therefore more complex *for humans*, is the organisation of human cognitive and communicative abilities.

Dispositions and susceptibilities

In order to suggest how, in an epidemiological perspective, anthropology and psychology can be mutually relevant, I shall introduce a distinction between dispositions and susceptibilities and, very briefly, go over a few standard issues in the study of culture.

Human genetically determined cognitive abilities are the outcome of a process of natural selection. We are entitled to assume that they are adaptive, i.e. that they helped the species survive and spread. This is not to say that all their effects are adaptive.

Some of the effects of our genetic endowment can be described as dispositions, others as susceptibilities, even though the distinction is not always easy to draw. Dispositions have been positively selected in the process of biological evolution; susceptibilities are side-effects of dispositions. Susceptibilities which have strong adverse effects on adaptation get eliminated with the susceptible organisms. Susceptibilities which have strong positive effects may, over time, be positively selected and become, therefore, indistinguishable from dispositions. Most susceptibilities, though, have only marginal effects on adaptation; they owe their existence to the selective pressure that has weighed, not on them, but on the disposition of which they are a side-effect. Both dispositions and susceptibilities need appropriate environmental conditions for their ontogenetic

development. Dispositions find the appropriate conditions in the environment in which they were phylogenetically developed. Susceptibilities may well reveal themselves only as a result of a change of environmental conditions.

Homo sapiens, for instance, has a disposition to eat sweet food. In the natural environment in which the species developed, this was of obvious adaptive value in helping individuals to select the most appropriate nutrients. In the modern environment in which sugar is artificially produced, this brings out a susceptibility to over-consumption of sugar, with all its well-known detrimental effects.

Basic concepts

With the distinction between dispositions and susceptibilities in mind, let us consider first the problems raised by systems of concepts. Each culture is characterised by a different system of concepts. It is an anthropological problem how much systems of concepts can vary from culture to culture. Are there, that is, universal constraints on the structure of these systems? It is a psychological problem how concepts are formed in individual minds.

One view of concept formation, which has inspired componential analysis in anthropology,⁷ and early studies of concept formation in psychology,⁸ is that a new concept is formed by combining several previously available concepts. For instance, if the child already had the concept of a parent and that of a female, she could form the concept of a mother by combining 'female' and 'parent'.

By this view of concept formation, concepts which cannot be decomposed into more elementary ones cannot have been acquired and therefore must be innate. Now, most of our concepts cannot be so decomposed: try to decompose, for instance, 'yellow', 'giraffe', 'gold', 'electricity', 'lackadaisical', 'dignity'. You cannot? Then, by this theory, these concepts, and hundreds or thousands more, should be innate, which, except for a few such as 'yellow', seems wildly implausible. Moreover, even when a concept could be formed by combining more elementary ones, there may be other reasons to doubt that this is the way its formation actually takes place: surely, children do not form the concept of a mother by constructing the intersection of 'female' and 'parent'. Rather, they form the concept of a parent by constructing the union of 'mother' and 'father'.

Another way in which concepts might be taught and learned is by ostension. You show a child a bird, you tell her, 'this is a bird', and, after a few such experiences, she acquires the concept of a bird. Ostension raises well-known problems: you may well point in the direction of a bird; you are simultaneously pointing in the direction of a material object, an animal, a crow, this particular crow, a feathered body, the underside of a bird, a thing on a tree, a source of noise, a black thing, and an infinity of other things. How is the child to realise that what you intend to draw her attention to is only one of these things and that the word you utter corresponds to only one of these concepts?

Logical combination and ostension are not mutually incompatible, though. Some admixture of them might provide a more plausible hypothesis. Ostension works if it operates under strong logical constraints. Imagine that the child, without having an innate concept of a bird, has an innate schema for zoological

concepts, and an innate disposition to apply and develop this schema whenever she is provided with information which seems relevant to the task. That is, if you point to an animal and utter a word, and unless the context suggests otherwise, the child's first hypothesis will be that you are providing her with a name corresponding to a zoological concept, and more specifically to a zoological taxon. She will expect the concept she is to develop to have the logical properties characteristic of taxonomic concepts. If you behaved according to her expectations, then she will be on the right track (and if you did not, what kind of a parent are you?).

The anthropological or epidemiological implications of this view of concept formation are clear: humans have a disposition to develop concepts such as that of a bird; as a result, such concepts are 'catching'; it takes remarkably little experience and prompting for children to develop them and apply them appropriately; once they are present in a language, they are not easily lost; a wealth of such concepts are therefore found in every language.

Let me speculate more generally. I assume that we have an innate disposition to develop concepts according to certain schemas. We have different schemas for different domains: our concepts of living kinds tend to be taxonomic; our concepts of artefacts tend to be characterised in terms of function; our concepts of colour tend to be centred on focal hues; etc. Concepts which conform to these schema are easily internalised and remembered. Let us call them *basic concepts*. A large body of basic concepts is found in every language. Of course, basic concepts differ from one language to the next, but they do not differ very much. The basic concepts of another language tend to be comparatively easy to grasp, learn and translate.

There is a growing body of research on basic concepts both in psychology and in anthropology, with more collaboration between the two disciplines in this domain than in any other.⁹ This work tends to show that individual concept formation, and therefore cultural variability, are indeed governed by innate schemas and dispositions.

This has been shown, of course, only for a few semantic domains. Could it be generalised? Are all concepts formed according to fairly specific innate schemas? I doubt it very much. First, there is no *a priori* reason to assume that concept formation is always achieved in the same way and falls therefore under a single model. Second, while some concepts are easily acquired with very little prompting, which suggests that there is a readiness for their acquisition, the formation of other concepts, say scientific or religious ones, takes a great amount of time, interaction and even formal teaching. These elaborate concepts are acquired within the framework of complex representations of the world. These representations and, therefore, the concepts which are characteristic of them, are based as much or more on susceptibilities than on dispositions.

Cultural representations

The social development and individual formation of representations of the world is the next issue I would like to comment upon from an epidemiological point of view.

Human cognitive abilities act, among other things, as a filter on the representations capable or likely to be widely distributed in a human population, i.e. capable or likely to become cultural representations. In a way, this filtering function has long been recognised. It is generally accepted among anthropologists that an adequate account of a culture's beliefs must show them to be somehow rational in their context.

What is meant by rationality is neither clear nor constant. As generally understood, however, rationality implies a certain degree of consistency between beliefs and experience and among beliefs. Rationality, then, presupposes cognitive mechanisms which tend to prevent or to eliminate empirical inconsistencies and logical contradictions.

Many anthropologists, from Durkheim to Clifford Geertz, have explicitly or implicitly assumed that all the beliefs of a culture, whether trivial or mysterious, are mentally represented in the same mode and therefore achieve rationality in the same way. In our terms, they are filtered by the same cognitive mechanisms. Holders of this view, when they want to explain apparently irrational beliefs, tend to turn to cognitive relativism: the hypothesis that criteria of rationality vary from culture to culture.

Other anthropologists¹⁰ have insisted that everyday empirical knowledge of the world, say the representation that honey is sweet, and religious beliefs, such as the dogma of the Holy Trinity, or scientific assumptions, such as the theory of relativity, are not the same kind of mental objects. Different types of representation achieve rationality in different ways. They are cognitively filtered by different processes.

Let me briefly contrast everyday empirical knowledge and religious beliefs.¹¹ I assume that we have a disposition to develop a certain form of empirical knowledge which could be characterised as follows:

—It consists in representations which are simply stored in encyclopaedic memory and which are treated by the mind as true descriptions of the world just because they are so stored.

—These representations are formulated in the vocabulary of basic concepts. That is, you cannot have this kind of knowledge about atoms, viruses, mana or democracy (which, I assume, do not fall under basic concepts).

—They are automatically tested for mutual consistency and in particular for consistency with perceptual inputs.

Everyday empirical knowledge is developed under strong constraints: conceptual, logical and perceptual. As a result, such knowledge tends to be empirically adequate and consistent. But, on the other hand, it applies only to some cognitive domains and does so rather rigidly.

Other forms of mental representations are developed with greater flexibility and weaker filtering mechanisms. They involve other cognitive abilities, in particular that of forming representations of representations.

Humans can mentally represent not just environmental and somatic facts, but also some of their own mental states, representations and processes. The human internal representation system—the language of thought, to use Jerry Fodor's expression¹²—can serve as its own meta-language.

This meta-representational ability, as we might call it, is essential to human acquisition of knowledge (and also to verbal communication, but I will not discuss this here). First, it allows humans to doubt and to disbelieve. Doubting and disbelieving involve representing a representation as being improbable or false. Presumably, other animals do not have the ability to disbelieve what they perceive or what they decode.

Secondly, meta-representational abilities allow humans to process information which they do not fully understand, information for which they are not able at the time to provide a well-formed representation. If an information processing device without meta-representational abilities finds itself unable to represent some information by means of a well-formed formula of its internal language, then it cannot use and retain the information at all. A device with meta-representational abilities, on the other hand, can embed a defective representation in a well-formed meta-representation.

Children use this ability all the time to process half-understood information. They are told things that they do not quite understand by speakers whom they trust. So, they have grounds to believe that what they are told is true, even though they do not exactly know what it is that they are told. A child is told, for instance, that Mr So-and-so has died, but she does not have the concept of death yet. The best representation she can form is defective since it contains a half-understood concept. In order to process that defective representation, she has to meta-represent it, i.e., to embed it in a representation of the form, 'it is a fact that Mr So-and-so has "died", whatever "died" means'.

This allows the child to retain the information, even though she does not fully understand it. It also gives her an incentive to develop the concept of death and, at the same time, provides her with a piece of relevant evidence for the development of this concept. Adults too, of course, when meeting new concepts and ideas that they only half-understand embed them in meta-representations.

Humans have, I assume, a disposition to use their meta-representational abilities in order to expand their knowledge and their conceptual repertoire. Meta-representational abilities, however, also create remarkable susceptibilities. The obvious function served by the ability to entertain half-understood concepts and ideas is to provide intermediate steps towards their full understanding. It also creates, however, the possibility for conceptual mysteries, which no amount of processing could ever clarify, to invade human minds.¹³

Rational constraints on half-understood ideas are not very stringent: the internal consistency of a half-understood idea and its consistency with other beliefs and assumptions cannot be properly tested: if any inconsistency appears, it may be due to a mistaken interpretation of the belief. To the child, the very idea of death and, therefore, the claim that someone is dead may seem self-contradictory, and yet she may nevertheless, and without irrationality, accept them on the assumption that the fault is with her understanding rather than with the concept or the claim. With half-understood ideas, what is known as the 'argument of authority' carries full weight.

The fact that mysterious ideas and concepts can easily meet criteria of

rationality is not sufficient to guarantee their cultural success. There are infinitely many mysteries competing for mental space, and hence for cultural space. What advantage do the winning mysteries possess? They are, I want to suggest, more evocative, and as a result, more memorable.

Evocation can be seen as a form of problem solving:¹⁴ the problem is to provide a more precise interpretation for some half-understood idea. This is done by searching encyclopaedic memory for assumptions and beliefs in the context of which the half-understood idea makes sense. Sometimes, the problem raised by a half-understood idea, for instance by a crossword clue, is easily solved with a short evocation. In other cases the idea is so poorly understood, and so unrelated to the subject's other mental representations, that there is nowhere for the evocation to start. The most evocative representations are those which, on the one hand, are closely related to the subject's other mental representations, and, on the other hand, can never be given a final interpretation. It is these *relevant mysteries*, as they could be described, which are culturally successful.

Apparently irrational cultural beliefs are quite remarkable: they do not appear irrational by slightly departing from common sense, or timidly going beyond what the evidence allows. They appear, rather, like downright provocations against common sense rationality. They are beliefs about creatures who can be in two places at the same time or who can be here and yet remain invisible, thus flatly contradicting universal assumptions about physical phenomena; creatures who can transform from one animal species to another, thus flatly contradicting universal assumptions about biological phenomena; creatures who know what happened and will happen without having to be there or to be told, thus flatly contradicting universal assumptions about psychological phenomena.

Some of these paradoxical beliefs could be given well-formed representations, but then they would have to be rejected on grounds of consistency. Moreover, having to reject them would cause another kind of inconsistency: it would be inconsistent with the assumption that the source of these beliefs is trustworthy. Overall consistency can be achieved only by treating these beliefs as mysteries. And as mysteries, they achieve relevance¹⁵ because of their paradoxical character, i.e. because of the rich background of everyday empirical knowledge from which they systematically depart. By achieving relevance they occupy people's attention and become better distributed than representations which are mysterious merely by being obscure.

Attempts to explain religious beliefs and other cultural mysteries in terms of some universal psychological disposition have been unconvincing. I believe they were misguided. Unlike everyday empirical knowledge, religious beliefs develop not because of a disposition, but because of a susceptibility.

Memory and oral literature

Up to now, I have only considered the role of cognitive processes of formation of concepts and representations. Other cognitive processes, processes of storage and recall in particular, and processes of communication are no less essential to the explanation of cultural facts.

Consider the case of a non-literate society, without schools or other learning institutions. There, most learning is spontaneous, most mental representations are constructed and stored and retrieved without deliberation. I would like to put forward a Law of the Epidemiology of Representations which applies to such a society. *In an oral tradition, all cultural representations are easily remembered ones; hard to remember representations are forgotten, or transformed into more easily remembered ones, before reaching a cultural level of distribution.*

This law has immediate applications, for instance, for the study of oral narratives. We can take it for granted that tales, myths, etc. are optimal objects for human memory, or else, again, they would have been forgotten. What is it about these narratives that makes them so memorable? What is it about human memory that makes it so good at remembering these tales? Here the mutual relevance of psychology and anthropology should be obvious. Yet the anthropological study of oral literature is, with a few exceptions,¹⁶ done without concern for psychology. In cognitive psychology, on the other hand, there is a growing body of research on the structure of narratives and its effect on memory,¹⁷ but little or no advantage is taken of anthropological expertise.

When new communication technologies appear, writing in particular, more things can be communicated, and internal memory is supplemented by external memory stores.¹⁸ As a result, memorisation and communication have weaker filtering effects. For instance, other forms of literature can develop and the particular forms found in oral tradition need not be maintained at all.

Concluding remarks

I should like to insist again that I am not offering an epidemiology of representations as a substitute for other anthropological enterprises, but as a further undertaking which I see as essential to the causal explanation of cultural facts and to fruitful relationships between anthropology and psychology.

Even so, it might be objected that the scope I am claiming for an epidemiology of representations is too large. It might be pointed out that all the examples I have discussed so far—concepts, beliefs, narratives—concern representations which can be individually internalised, and which are cultural as a result of a great many individuals internalising them. But what about institutions? Surely, a school, a ritual, a judicial system are cultural things, and yet they are not the kind of things that can be internalised by the individual. Do they not fall, then, outside the scope of an epidemiology of representations, and is not the claim that the causal explanation of cultural facts has to be encompassed in such an epidemiology grossly exaggerated?

Well, here is the counter-objection. An epidemiology of representations does not study representations, it studies distributions of representations (and therefore all the modifications of the environment which are causally involved in these distributions). Cultural classifications, beliefs, myths, etc. are indeed characterised by homogeneous distributions: closely similar versions of the same representation are distributed throughout a human population. Other cultural distributions are differential: the distribution of some representations in

certain ways causes other representations to be distributed in other ways. This, I submit, is characteristic of institutions.

Some sets of representations include representations of the way in which the set should be distributed. *An institution is the distribution of a set of representations which is governed by representations belonging to the set itself.* This is what makes institutions self-perpetuating. Hence to study institutions is to study a particular type of distribution of representations. This study falls squarely within the scope of an epidemiology of representations.

Let me end by illustrating this characterisation of an institution with an example. Consider the Malinowski Memorial Lecture. It is, you will all agree, an institution. A representation was put on paper when the Lecture was first instituted; unwritten additions were made in the course of time. This representation calls for the yearly distribution of invitations to a speaker on the one hand, to an audience on the other; it represents the speaker distributing to the audience the complex representation called a lecture; it represents the lecturer including in his lecture some deferential references to Malinowski; it represents the lecturer ending the oral representation after an hour or so, so that the by then thirsty audience can go for a drink. It represents the lecturer, a few weeks later, submitting a written version of his oral representation, to the journal *Man*, thus ensuring a wider and more lasting distribution of it. When all these representations have been distributed according to one of them, then you have—or rather you have had—a Malinowski Memorial Lecture.

NOTES

¹ See for instance LeVine 1973; Jahoda 1982.

² I do not mean to imply that the psychology of emotions is irrelevant to the explanation of culture. I tend to believe, though, that important advances are needed on the cognitive side in order better to understand the role of emotion in culture. For recent discussions, see Lewis 1977; Schweder 1979a; 1979b; 1980; D'Andrade 1981; Levy in press.

³ For an introduction to epidemiology, see MacMahon & Pugh 1970.

⁴ As exemplified by recent work in the philosophy of biology; see Darden & Maull 1977; Darden 1978.

⁵ For a thorough discussion, see Sperber forthcoming.

⁶ For two different versions of the Platonist approach, see Popper 1972 and Katz 1981.

⁷ See Tyler 1969.

⁸ For instance Vygotsky 1965; Bruner *et al.* 1956.

⁹ See for instance Berlin & Kay 1969; Miller & Johnson-Laird 1976; Rosch & Lloyd 1978; Keil 1979; Ellen & Reason 1979; Smith & Medin 1981; and the recent syncretical papers of Scott Atran 1981; 1983; forthcoming.

¹⁰ E.g. Bloch 1977; Sperber 1975; 1982a.

¹¹ For a more detailed discussion, see Sperber 1982a.

¹² See Fodor 1975.

¹³ For a detailed discussion see Sperber 1982a.

¹⁴ For a detailed discussion, see Sperber 1975; 1980.

¹⁵ For a discussion of relevance and its role in thought and communication, see Sperber & Wilson forthcoming.

¹⁶ In particular Colby & Cole 1973. Lévi-Strauss (in particular 1971) has alluded to the role of memory in shaping myths, but without going at all in the psychology of memory. See Sperber 1973; 1975; 1982b for a discussion of his contribution.

¹⁷ See for instance Rumelhardt 1975; Kintsch 1977; Mandler & Johnson 1977; van Dijk 1980; Brewer & Lichtenstein 1981; Wilensky 1983.

¹⁸ See Goody 1977 for an anthropological discussion.

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