Glauco Sanga

Introduction

Human Nature

Commenting on *The Giaour* by Byron, in 1818 Ludovico di Breme affirmed the romantic belief in the "continuous action of omnigenous nature," and defined its scope. "If I speak of exposing the spirit to the action of nature, I mean its moral frames as well as its physical ones, and I hold man as the first of the objects to contemplate, and a knowledge of times and customs as an essential part of this nature." Giacomo Leopardi answered him in the same year, disagreeing on everything, except on the nature of nature: "not that nature which not only surrounds and presses on every side, but is within us alive and shouting, can ever become extraordinary for men."

Indeed, we are nature too; and this is a good starting point for an understanding of the special relationship that man has created with nature—with ourself and at the same time with what is other; a relationship that starts with *human nature* and broadens out progressively towards the construction of a nature exterior to us, a knowable, controllable and exploitable nature.

If we are part of nature, human culture can be understood as the means by which our species relates to nature, through the transference of biological functions into the socialized external objects of tools and language. Viewed in this light, culture is in fact part of our biology, part of human nature: tools are cultural extensions of biological organs, and our relationship with the world and with others is a symbolic relationship in that it is mediated by language.

Nature knowledge—relations in nature—which every living being implicitly possesses, in humans *also* constitutes an exteriorized and objectified heritage, on account of the specific form that the particular biological strategy we call culture assumes in us. Culture is not exclusive to humans, because other animals that use tools and symbols can be found, but in us it is necessary, because no human activity exists that is not cultural, which does not have a symbolic "form."

All human activity, practical and symbolic, has a direct relationship with nature: from the economic sphere of the vital to the symbolic sphere, which is to say from modes of subsistence and reproduction to modes of relating, organizing, and reflecting. Nature knowledge is a point of encounter and amalgamation—not of opposition—between categories that are at the basis of human action, such as practical and symbolic, functional and formal, where the abstract is not considered in opposition to, but rather a specific "form" of the concrete.

Studying the origin and evolution of tools (that run alongside the origin and evolution of language), André Leroi-Gourhan has demonstrated that function assumes a form, because every form is the expression of a specific functionality,

and this is true on the biological level even before the cultural level. Thus form cannot be arbitrary, it is always necessary—both the form of a natural organism and the form of a cultural object (just like language, which, far from being arbitrary, is simply necessary).

Elaborating the concept of "ethos of transcendence in value," Ernesto de Martino has shown us that in human culture the economic takes on meaning, since it is impossible to conceive of a purely biological *human* activity: every human action, even the most basically vital, is always symbolic *as well*. See the deep analysis of Pasquinelli (1984).[1]

In human beings the "economic"—or the "vital," if one prefers—must be seen as referring to the activity of subsistence in the widest sense of the term, including reproduction, because there is no difference between *human* production and reproduction, both having been symbolically identified since the origins of mankind. We have become human, distinguishing ourselves culturally from the other primates, with the development of hunting activities, for which tools were fabricated, and, at the same time, with the development of language. Hunting transforms subsistence-activities from animal to human, from biological to cultural, because the Paleolithic hunter, sexualizing hunting, identifying his weapon with his penis, production with reproduction, gave it a sense that transcended the need of nourishment: it went beyond the biological scope of the practical to enter the cultural scope of the economic, which is practical and symbolic at the same time. And here it is clear that culture is not opposed to nature, but is a way of living in nature—the human way.

For this reason the nature-culture dichotomy is unsatisfactory, in the same way that the many other dichotomies of which we regularly make use are insidious and misleading, such as human-animal, sacred-profane, religion-magic, local-global, *langue-parole* (competence-performance), objective-subjective, right up to the most radical and unsuspected, life-death. Dichotomy is an efficacious but rudimentary tool; it is an initial analytical approximation, based on the principle of maximum differentiation, which, while it allows us to distinguish, does not permit us to regain the solidarity that is at the origin of distinction—distinction petrified into a binary opposition which, by its polar nature, makes a simple difference into something radical and extreme.

The conference would go beyond summarizing the "state of the art" of the studies on *Nature Knowledge*—American, French, English and Italian (in particular the work of the late Giorgio Raimondo Cardona)—and really act as a forum for the useful comparison of tendencies, methods, and results.

In the following, I provide a succinct account of the contributions, notably the theoretical positions expressed by the participants.

Classification

After pointing out that folk classifications have mainly been studied in the three highly structured domains of the natural world (plants and animals), color terms,

and kinship systems, Marta Maddalon at once raised the theme that proved central to the whole conference, namely that of the contrast between universal models—proposed by the scholars of a cognitivist orientation—and culturally determined models. From this main theme stems a series of connected issues, such as the innate versus the acquired (innate taxonomic capacities with respect to culturally acquired capacities), perception versus utility (formal classifications with respect to functional classifications), realism versus idealism (categories as entities with real existence in the external world with respect to categories as mere sociocultural constructions). According to Maddalon, one can hypothesize a universal level in the perception of nature that favors a morphological form of classification; in modern postagricultural societies there is a greater development of lower taxonomic ranks (varietal, cultivars) to the detriment of higher ranks (generic).

Maddalon also raises a number of other questions, notably: (i) the importance, from the taxonomic point of view, of the intermediate level, the space between the generic and life-forms levels, (ii) the concepts of metonymy, metaphor, and prototype (with examples taken from the classification of birds in Latin and in Italian dialects), (iii) the "interplay of similitudes" between the various spheres of the natural world, and (iv) the suggestion that we should examine just how much scientific classifications owe to ethnoscientific classifications.

In chapter 1, Brent Berlin points to two universal principles of ethnobiological classification: not all generic and specific taxa are named, and those that are named are done so on the basis of the perception of affinities independent of culture, which reflect the intrinsic organization of nature and not a human, economic or symbolic order. Berlin presents an exceptional example: the folk botanical system of classification of the informant Alonso Méndez Ton, a Tzeltal Maya Indian from the Highlands of Chiapas, Mexico. This folk system, representing some 900 scientific genera and nearly 3000 valid botanical species, is both natural and comprehensive: an unfamiliar species is identified on perceptive grounds and is classified by similarity (a known taxon is defined as "genuine," "true," a taxon assimilated to a known one is described in such terms as: "it's like an," "it's similar to"). Alonso Méndez Ton's system is natural because it is perceptually based on psychological principles that underlie what we know today as scientific systematic botany. "When his classification of the flora does not conform with currently recognized phylogenetic boundaries of Western botany, it is generally the case that the organisms in question nonetheless share many perceptual features in common which justify his grouping them as members of the same conceptual category."

According to Roy Ellen, in chapter 2, it is undoubtedly legitimate to seek classifications that can operate independently of cultural inputs or context, but these cognitive propensities are so general and abstract that they can tell us little about the concrete classifications of people, at lower and more functional levels. "Noncultural input operates in terms of the process of categorization, rather than underpinning particular categories. And certainly regularities may be the product of general mechanisms operating across different and very varied domains, constrained by the data being organized." In particular, "in the domain of living kinds these tendencies converge in a particular way, not obviously because of features of

the mind that does the classifying, but because of regularities of the objective world which is classified and to that the mind responds." The universality of the ethnotaxonomies proposed by Berlin actually functions only if we clearly separate the general-purpose models (logical and 'natural') from the special-purpose models (those which have arisen for cultural reasons). It is only these latter that are found in ethnographic practice; indeed, the more profound the research, the more the taxonomies tend to collapse, since they work well only with simplified data, as is demonstrated, for example, by the classifications of domesticates.

Ellen also emphasizes the difficulty of drawing a clear distinction between the symbolic and the mundane, the social and the non-social: "symbolic things are in an important sense practical, and practical classifications of the non-social world often rely on metaphors that are ultimately social, as in the use of the terms 'genus' and 'family' to organize plants and animals." Therefore, "it is impossible, for example, to make sense of Austronesian terms and categories for 'bird' and for 'tree' without considering utilitarian and symbolic criteria."

In chapter 3, Oddone Longo points out that Aristotle's zoological classification is not intended to be systematic and does not introduce new names, but uses the common ones. It is based on traditional popular knowledge, in particular on that of professional specialists: shepherds, hunters, and fishermen. While the criteria adopted are perceptive (shape, color, size) and ecological (habitat), the background behind Aristotelian classifications is certainly utilitarian, since the nucleus of knowledge was provided by the professional techniques of breeders and hunters. Thus we are not dealing with abstract knowledge, but with concrete knowledge. There is no coherent taxonomic system; animals are grouped according to the point of view of their treatment (anatomical, ecological, ethological etc.) in different and often contrasting classifications, which are not ends in themselves and general, but functional and special.

In his chapter 4, John Trumper presents the two great models of classification that have been present in our culture for 2500 years, Aristotle's "ontological" model and Plato's "henological" model. The ontological model presents a unitarian vision of the world, with a substantial symmetry between the parts of the natural continuum and "precise symmetries between individual 'souls,' in which genus/species etc. are analytical tools belonging to a particular model; individuals are characterized by 'sums' of accidents or properties, fuzzy classes are either accommodated or relegated to the 'wondrous,' perhaps the older system." This archaic model, which formalizes a previous vision of the world, is formulated by Aristotle and taken up by Theophrastus, Galen, Dioscorides, Lucretius, and Lucan. The henological model presents a hierarchic vision of the world, in which the Anima Mundi reveals itself in individuals; it has hierarchies in tree-form, uses binary traits with absolute definitory value, and has no room for fuzzy classes. It is Plato's model: the One generates All-Soul which generates the souls. Already present in Homer (the "golden cord," the chain of being of the *Iliad*), it is principally developed by Plotinus: the One generates a series of dyadic principles, above all the Nous. Since Plotinus entered the Christian Middle Ages, via Arabian trans-

mission, as an Aristotelian, and his pupil Porphyry was translated by Boetius, a syncretism was created between the two models.

In the Christian west the ontological model prevailed (with Anselm of Canterbury, Thomas Aquinas), but the Neoplatonic model is also strongly present, propagated by Johannes Scotus Eriugen, by mystic monachism, and by the Franciscans (above all Raymond Lull). With Nicola Cusano it entered the University of Padua and prevailed over the Aristotelian model. When the hierarchic ladder model, with differences that function dichotomously in binary fashion, was adopted and perfected by Descartes, Newton, Leibniz, Linnaeus, and Darwin, a breach was created between popular and scientific classifications. Thus folk systems, whether European or extra-European, derive from the first model, and scientific ones from the second. The difference is not so much in the hierarchy, which in the sense of "ranking" and "relations" is also present in the first model, as in the algebraic approach to hierarchy.

In Indo-European denominations there are precise symmetries between humans, other animals, birds, fish and even plants, which have nothing to do with similitude, metonymy, or metaphor, but which reflect an ancient worldview: when the "shoulder muscle" is called "mouse" (Latin *musculus*), and the "thigh muscle" is called "lizard" (Latin *lacertus*), they "are small animals that move under the skin of the man-animal as a composite higher animal who exists conjunctively with other animals in an animal continuum."

Naming

Glauco Sanga sets forth a set of questions about nature naming: (i) linguistic mechanisms (phonetic, morphological, semantic, rhetorical), such as onomatopoeia, derivation, extension, specialization, metonymy, metaphor; (ii) organizing principles: physical, structural, utilitarian, social, magic-religious; (iii) transfer of naming systems from one domain to another; (iv) totemic naming; (v) taboo names, hunting names; (vi) arbitrariness and motivation in the naming process.

In chapter 5, Mario Alinei believes that motivation is the most general naming mechanism. The most frequent types of motivation are, in order of importance: (a) metonymy, (b) metaphor, (c) expressive phonosymbolism, usually connected with baby talk, and (d) onomatopoeia. According to Alinei, the arbitrariness of the sign is an inescapable principle. The question that arises is the following: since words are arbitrary, how can they also be motivated? Motivation is indispensable to socialize the word, to make it comprehensible. The sign is intrinsically arbitrary, opaque, it is the motivation that renders it transparent and comprehensible. "Motivation is a basic component of the genesis of the word, but not of its function. Moreover, arbitrary is also the *choice* of motivation." This raises an intriguing question: "How could the first words uttered by *Homo loquens* be motivated, in the absence of pre-existing words?" An adequate answer can be supplied by the phonosymbolism of infantile language, much more than by onomatopoeia. "Sig-

nificantly, thus, at the glottogonic level, motivation and arbitrariness appear to be inextricably interwoven, as if showing the importance of both aspects."

On the other hand, in chapter 6, Brent Berlin believes that phonosymbolism calls into question the arbitrariness of the sign as decreed by Ferdinand de Saussure. In chapter VI of *Ethnobiological Classification* (1992), Berlin proposes that the names applied to living things, especially the names for animals, often reflect some aspect of the inherent qualities of the organisms being named. The productive use of sound symbolism is particularly relevant for animal names: the names for "bird" and "fish" in Huambisa, a Jivaroan language of Amazonian Peru, are, for example, strongly marked by sound-symbolic properties: bird names show high frequency segments, in contrast with the lower frequency segments of fish names. In addition, names of small birds and fish commonly show high frequency vowel [i] stems, while larger birds and fish are referred to by names made up of the low frequency vowels [a] and [u].

The analysis of the names of the "tapir" and the "squirrel" in languages of nineteen distinct linguistic families of South American Indian languages confirms the hypothesis of size-sound symbolism: terms for "tapir" show the central vowel [a] (low acoustic frequency, hence "large/slow") and terms for "squirrel" exhibit the high front vowel [i] (high acoustic frequency, hence "small/quick"). "Tapirs are natural kinds that are large in appearance and slow (relative to squirrels) in their behavior; their names show a preference for the vowel [a]. Squirrels are small and quick (relative to tapirs), and their names show, in contrast, a preference for the high front vowel [i]." Berlin concludes that "the study of ethnobiological sound symbolism may shed light on the evolution of humans' representation of the perceived structure of the natural world in speech."

In chapter 7, Maurizio Gnerre studies the names of streams of the Shuar (Jivaroan, Upper Amazon, Eastern Ecuador), made up mostly of the male names of animals and the female names of plants (useful or cultivated). The animal or the plant name does not directly refer to the stream, since the stream is named generally through the mediation of the name of a person. It is in fact the person that denominates the stream (often the name of an eminent person), humanizing the "space" by transforming it into "place": "Persons are already 'given' as physical beings and necessarily named and culturally shaped, while places are 'created' through naming. People exist in (come from, traverse and go to) places, and 'places' arise because of human activities." Most Shuar people names are connected with an animal or a plant, but, more than to the person, the names refer itself to his *wakan'* (usually translated as "soul," is means rather "self-consciousness"): animals and plants are animated by male or female *wakan',* and consequently human beings have the corresponding names. A person is a unique individual and gendered realization of a *wakan',* occupying a place "vacated" by a dead person: "therefore, *wakan'* is the hidden link between persons and animals or plants, and it is the referent of many names."

The *wakan'* circulate as names among humans, animals, plants and some minerals, and name transparency favors this circulation. The Shuar language privileges name transparency. "Transparency, as a general linguistic feature, is strongly

related to the issue of intralanguage relations and of relative arbitrariness; as a characteristic of names it makes the lexicon 'lighter.'" Transparency must nonetheless be distinguished from motivation; the former term covers a much larger conceptual area than the latter: many names are transparent, which is to say analyzable, but at the same time they are not clearly motivated; no motivation precludes opacity. "For most fully transparent Shuar river names there is no obvious motivation, and we can only guess at one. When, as in most Shuar streams' names, metonymy or synecdoche is present, motivation is only a sort of *ex-post* construction," as in the case of a name such as *Pamá éntsa*, "stream of the tapirs," for which we can only advance the purely hypothetical motivation that there were tapirs there.

Jane Hill, in chapter 8, deals with the problem of lexical loss among the Tohono O'odham (formerly "Papago") of the Sonoran Desert in south-central Arizona and the northern border of Sonora, Mexico. Her conclusions add to the common proposition "that when knowledge is lost, names are lost with it" its reverse, which is equally true: when names are lost, knowledge is lost with them. Empirical data find their theoretical basis in the reaffirmation of the intrinsic and necessary link between form and significance. Jane Hill also criticizes Saussure's notion of the arbitrariness of the sign, but from a point of view within structuralism. Adopting the position of Emile Benveniste, she emphasizes the necessity of the relationship between signifier and signified, all within language, thus excluding the third term (the external referent) introduced by Saussure: "meanings reside only in the language and signifiers project their signifieds rather than somehow matching up to categories in the world." For this reason Hill does not agree with Berlin, at least on the level of the practical; practical knowledge, although it must include universal components, is profoundly local and specific.

In chapter 9, Giovan Battista Pellegrini underlines the importance of metaphor and metonymy in the process of naming. Through deep etymological analysis and comparison, he provides various examples, taken from Italian dialects and romance languages, of the use of animal names for plants and tools, and he also analyzes metonymies among parts of the body.

In chapter 10, Nicole Revel analyzes in detail the processes of lexicalization of natural objects in the Palawan language of the Philippines. The mechanism of lexicalization of plants is distinct from that of birds and insects. Derivation is one of the six main lexemic types. It is interesting to note that a particular prefix, *mäg-*, is used in the vocabulary of wild plants to designate an analogy, a similitude: "related with," "looking alike" (e.g., *mäg-mamaqan* means "like areca nut"). In the lexicalization of birds and insects in Palawan, as well as in many languages of the Philippines and South-East Asia, ideophones are widespread and productive, both "sound icons" and "visual icons." Revel points out that "the link between sound and meaning is not an absolute one, it is rather to be considered within the respective constraints of the language where it appears. As R. Jakobson has analyzed, 'symbolism, although conditioned by the neuropsychological laws of synesthesia—and according to these very laws—is not the same for all.'" To name singing birds and stridulant insects, the root-word is made from an onomatopoeia. For the

names of non-singing birds and non-stridulant insects, the ideophone-making turns to visual perception, as in the naming of plants, mushrooms and shells.

In chapter 11, John Trumper tackles three topics: taxonomic levels, onomatopoeia, and metonymy and metaphor. What is the pertinent level at which naming processes begin? Whether at the taxonomic and perceptual generic/specific level, or the intermediate or life-form level, and whether from a particular level lexical spreading is then directionally bottom-up or top-down as a productive process. He discusses a few examples in depth: we can observe in Latin "originally a bottom-up movement, involving the naming of a life-form built from lexical substance existing at the intermediate level, i.e., *quercus* (generic) ⊂ *arbor* (intermediate) ⊂ *arbusta* (life-form: a collective neuter pl., derived originally from *arbor*) ⊂ *sata* (unique-beginner), whereas in medieval Latin we have the converse, top-down expansion in which the life-form becomes a new intermediate, aligned with *arbor*, leaving a covert life-form: *quercus* (generic) ⊂ *arbor* vs. *arbustum* (intermediate) ⊂ X (life-form) ⊂ *planta* (unique-beginner). Thus we note that partonomic *planta* (originally tree-cutting, vine-cutting, slip, shoot) has taken the place of partonomic *sata*." "Seed" in Italian dialects reveals two different treatments: "lexical creation and movement appear to begin at the unique-beginner stage, in some cases, with top-down movement partonomic > unique-beginner > life-form > generic (derivatives of Latin *sēmen* 'seed'), at others with a bottom-up movement partonomic> generic > life-form (derivatives of Latin *cibus* 'food'). In the first case the movement is from 'sowing,' a typically agricultural concept, in the second, from 'seed' = 'food,' which would seem still characteristic of a plant- or seed-gathering society."

As regards the linguistic role of onomatopoeia, Trumper agrees with Whitney that "if we admit there ever was an imitative stage in human proto-linguistic development, then it must be a short-term phase in evolution: 'the onomapoetic stage was only a stepping-stone to something higher and better.'" He adds furthermore that this stage is not a social or anthropologically significant state, but is determined by what humans biologically have in common. From the linguistic point of view, much seems to depend on language typology: an agglutinative or isolative language may, because of its very morphology, keep associations with onomatopœic bases longer, while flexional languages, more especially if stress-timed, may destroy initial onomatopœic symmetries in their normal development. Since there is a continuous remotivation of sound representation, onomatopœa is decidedly culture-specific.

Trumper argues (see also chapter 4) "that in the case of natural phenomena (animals, birds, fish, plants) naming processes involve either straightforward similitude or the application of particular symmetrical schemes between animals and plants, animals and fish, fish and birds, etc. in terms of a particular cosmic vision": for example, "wolf" in Latin and Italian dialects presents a network of correspondences that include (a) mammals, (b) plants, (c) fish, (d) birds. He emphasizes that "none of these cases represent instances of classical metonymy or metaphor, rather the way in which particular Cognitive Models are interrelated with each other in a particular vision of the natural world"; whereas metonymy and

metaphor are at work in trade jargon, which represents a necessity for naming non-natural objects, artifacts. In the tinker jargon of Calabria, southern Italy, there is "a terminology for metals and metal parts that is far richer than that of any dialect, richer even that of some standard languages, in which the primary element in naming seems to be synecdoche and other mechanisms of classical metonymy, e.g., *campanaru* 'lead' is 'object made of lead' (bell) > 'substance lead.'" Trumper puts forward the interesting hypothesis that specialization, whether in agriculture, or in industry or rather proto-industry, "creates an overall situation that brings utilitarian criteria to the fore and imposes them on and above all other possible criteria. Man's pure classificatory instinct in specialized societies or groups seems to give way to a series of utilitarian criteria which then determine intricate metonymic chains, therefore the creation of metaphors."

Thought

Daniel Fabre proposes a frank confrontation between anthropology and cognitivism, posing three crucial questions. (1) Should thought be collocated inside man, inside the spirit, the mind, or outside, in the public use of signs, in symbolic exchange? "For the anthropologist there is no spirit that is not objective. Thoughts are filled with content in a historic context, in the greater or lesser *hic and nunc* of a tradition, of customs, of institutions." (2) Ethnoscience has been constructed on the basis of the empirical approach to objects of science. However the object is not the botany or the zoology of a group, but the contents of thought, of which these areas of practical knowledge are merely occasions and supports, which is to say, in the last analysis, man himself, who uses and produces knowledge and thought. Therefore "we should examine the theoretical status of the micro-specialties produced by the plural notion of 'knowledges.'" (3) What has happened, today, to the universalistic program of anthropology of passing from the local to the general, from particular societies to man as such? To define universals as logical constrictions inherent to the human spirit means naturalizing or desocializing thought, relocating it inside the spirit. In this case there would be more direct methods than the ethnographic one to observe thought, and anthropology would either prove superfluous or lose its specificity.

Jean-Pierre Albert, in chapter 12, observes that the debate between ethnoscience and symbolic anthropology has an exact parallel in the debate concerning the specificity of the religious. The evolutionist argument in favor of the thesis of universals in knowledge of natural realities claims that certain forms of behavior are adaptive, and certain cognitive abilities are the outcome of the evolution of the species and are genetically innate. But adaptation, remarks Albert, is not only biological, but also social; thus we may suppose that the more general constraints on social life introduce an aspect of universality. In addition, similar societies produce similar rules and solutions.

The religious dimension is usually implicit in social rules: "religion may well be a socio-cognitive arrangement intended to accredit the unbelievable, i.e., state-

ments in contrast with the world to which we spontaneously surrender our individual cognitive abilities." If we consider that the realities postulated by religion, although distinct from natural realities, tend towards the form of objectivity, "this means that religion gives an objective form (or origin) to principles of action, obligations, rules." Religion provides the social with an "objective" and "natural" form: "Nothing seems more common in the most varied mythological and ritual systems than the idea of continuity, or a community of essence between the order of nature (cosmic order) and social order. Indeed, the two areas of rules can be joined simply by exchanging some of their features: the social order gains in terms of presuming necessity and universality; nature, on the other hand, becomes a moral entity, a world of rule and not laws (in the sense of deterministic laws). In plainer words, nature tends to become a projection of society, while its supposed laws at the cosmic level are a reflection of the more general constraints of social life. We thus understand how cosmological universals may exist, not as expressions of innate mindsets, but as correlatives of the more general constraints of social life." The very idea of "nature in general" is never a naturalist representation; equally the *naturalization* of principles of a social order refers to a representation of nature as the place of the immutable, of order and of necessity.

According to Marlène Albert-Llorca, in chapter 13, one cannot distinguish ethnoscience from symbolic thought, because folk knowledge of nature is not always the simple empirical record of observable data, as it may also be the outcome of the play of symbolic thought itself. The notion of ethnoscience is problematic, because it suggests, on the one hand, that people have a relationship with nature that is not only utilitarian but also speculative; on the other hand, it implies the universality of the knowledges of nature. Berlin, totally rejecting the Whorf's relativistic vision, states: (a) that ethnoscientific classifications are based on observable affinities (morphological or ecological or ethological) of the species themselves, independent of the cultural importance of these species; and (b) that these classifications always take the form of taxonomy, i.e., a hierarchical classification so that at a given level of hierarchy all the categories are mutually exclusive. But in this way only one part of the indigenous knowledge of nature is considered. Alongside the formal criteria (morphological, perceptive), there also exist the functional (utilitarian) criteria and the symbolic criteria. Of an animal or a plant people know the form, the practical use and also the symbolic value. Ethnoscience runs the risk of isolating arbitrarily one form of knowledge from the others; classifications cannot be separated into "symbolic" and "mundane," because symbolism is not outside the world.

In chapter 14, Giulio Angioni observes that in the study of nature knowledge too much emphasis has been placed on an approach that privileges linguistic means of knowing, almost as if they were the only ones, reducing folk knowledge to the operations of classifying and naming. Naturally language is important, but, as Piaget teaches, it is not the basis of thought, nor can every thought be expressed linguistically. On this subject, Angioni points out the importance of the traditional knowledge implicit in "doing." This is an operative knowledge, a set of experiences, abilities and knowledges incorporated in the individual and in the group; it

is pretheoretical, not verbalized and not easily verbalizable, and present in primitive societies as in our own society: not abstract notions and oral memory, but embodied knowledge and body memory, which are not "normally the subject of reflection and explicit and conscious speech but, since they have become mechanical concatenations of trains of thought and gestures, they are a kind of second nature, almost a part of our instinctive side and outcrop in our conscious minds almost exclusively in the case of accidents, difficult situations or something that disturbs their normal utilization, which does not require lucid behavior or special attention" (think, for example, of the operation of tying one's shoes or tie). "Even today, as in pre-industrial societies, this patrimony of abilities and elementary notions is learned and becomes incorporated mostly by impregnation, inference and experience."

Man "does not perform only semiotic operations such as naming and classifying: together with these, and before these, he acts to satisfy needs; he thinks of nature so as to 'do' and not only and not principally so as to say.'" Therefore, it is perhaps easier to find cultural universals in the very field of thought-for-doing, in that of practical abilities, than in the field of thought-for-saying, or in any case of knowledge formulated and organized through language: "break, cut, pound, tear, throw and dig, besides techniques of the body (Mauss): how to run or jump, get dressed or inhabit, are cultural universals (besides being precultural universals) more than to name, classify, categorize or elaborate other forms of semiotic knowledge concerning nature."

For Jack Goody, in chapter 15, the topic of nature must be considered in terms of systems of knowledge, influenced by specific cultural constellations, like the means of communication (e.g., literacy) or the means of production (e.g., pastoralism). Cognitive scientists should provide some satisfactory proof of the existence of universals, which can have some other explanation, like transcultural experiences (which are not always universal but widespread). Taxonomies of natural objects should also be accounted for in historical terms, because they change over time (even though the so-called traditional cultures are often seen as self-perpetuating in their conceptualizations). In addition, taxonomies are not always as explicitly formalized as written accounts suggest: any form of written knowledge tends to generalize and make sense of human behavior. "To establish order out of the varied and abundant material which we are faced with, we select a limited number of aspects of the phenomena to deal with, to re-present."

The same problems present themselves when one wishes to fit thought into taxonomies. Following Lévi-Strauss, one is forced to categorize concepts into oppositional binary pairs, analogical schemes that exclude ambivalence. Even where taxonomies remain the same, the cultural context of reference can change completely: a cow, says Goody, is not the same thing for me and for my Anglo-Saxon ancestors; the position of the cow in my cognitive space has changed: the term has remained but with a quite different practical and symbolic meaning. According to Goody it is difficult to distinguish between symbolic and pragmatic classifications of nature, since every linguistic use is symbolic. One has to work on a plurality of taxonomies, which vary according to the context, "so that the tomato

is a vegetable in one context and a fruit in another." For example, the LoDagaa of northern Ghana do not know families, genres or species: they classify animals implicitly into edible and inedible, explicitly into wild and domesticated, and into black and white for ritual uses.

In chapter 16, Francis Zimmermann enters directly into the dispute between symbolic anthropology and cognitive anthropology, the biologistic naturalism of which he criticizes. Zimmermann defends a symbolic anthropology and a comparative ethnology, which are situated on an intermediate level on the scale of abstraction: "Neither too concrete nor too abstract. Neither specific (related to one particular language and culture) to the point of their being untranslatable, nor abstract to the point of their being unable to refer specifically to one particular semantic domain. Bodily humors like bile and phlegm in Galenic and Ayurvedic medicine seem to perfectly exemplify this kind of concept and names that are endowed with ontological implications." Zimmermann, in addressing the question of universals in the context of comparative ethnology with special reference to nature knowledge, tries "to find a way out of the dilemmas of cultural relativism. In the field of medical anthropology, for example, cultural relativism, which has been the dominant paradigm for the last two decades, resulted in our juxtaposing all the medical systems of the world with one another, on an equal footing, as so many pieces of local knowledge good for transmission, and so many ethnic commodities good for consumption. It is high time we broke with the prejudices of relativism." But we must not for this reason seek universal or primary concepts, as one used to say in the realm of cognitive sciences, but rather conditional or implicate universals.

Use

Antonino Colajanni emphasizes the dynamic and adaptive nature of indigenous knowledge systems that often have—it must not be forgotten—a long history behind them, of which it is important to know about. "Native societies possess their own forces of response and reaction: they are, in short, active and not passive subjects, also in the field of technique and natural knowledge." It is essential to reflect on the process of *technical domestication* that the West has exercised over native systems, and on the local forms of resistance, "technical syncretism," and functional re-adaptation of elements from outside. "This progressive recognition of the potentiality of knowledge systems and of indigenous action is producing—and will increasingly continue to produce—a beneficial effect on the processes of creation and re-creation of local *social and cultural identities*, which, as is well-known, constitute an important aspect of social change."

In chapter 17, Giulio Angioni observes that, compared to official knowledge, traditional knowledges and skills are not only tacit, implicit, intuitive and informal, but also and above all politically subordinate. The "bearers" of traditional knowledge know what to do but they do not have the power to do it. Angioni reminds us that Antonio Gramsci has some important things to say on these themes in his

Prison Notebooks. Angioni goes on to examine the propagation, in the context of contemporary globalization, of a form of mild racism, founded on the sense of the superiority of the West. Angioni claims that anthropologists have the unwitting responsibility for having spread the idea that ethnocentrism (understood as the inferiority of the other) is universal, shared by other animals and almost genetic. But ethnocentrism is neither universal nor inevitable. There is not only the attitude of considering others as inferior, but also of considering them as superior (as in the case of the Aztecs, the Incas, and of Sardinia).

Roy Ellen and Holly Harris—whose contribution is given in a summarized form in chapter 18—point out the changing and often contradictory scientific and moral attitudes towards indigenous knowledge. "Much Western science and technology emanates from European folk knowledge (e.g., herbal cures) and knowledge acquired in a colonial context. The nomenclature and classificatory schema employed by Linnaeus, for example, depended extensively on Asian folk knowledge as this was absorbed into the writings of colonial naturalists working in the seventeenth and eighteenth centuries." According to Ellen and Harris, indigenous knowledge, which is a tacit, intuitive, experiential, and informal, will always be necessary as an interface between real-world situations and literate expert knowledge, the latter of which will always have to be translated and adapted to local situations.

Tim Ingold, in chapter 19, deals with two separate arguments: (i) the man-environment relationship, and (ii) traditional knowledge. He proposes "to replace the conventional idea of organisms and persons as distinct, substantive entities with a view of the organism-cum-person as a position or nexus—situated within an unbounded field of relations—where growth is going on." Ingold considers that for social anthropology the mycological model of continuity among individuals (fungi) is more suitable than the zoological model of discrete individuals (animals); he thus suggests the model of the *fungal person*, because the person is not a substantive entity, but is a point of growth or emergence within a wider field or network of social relationships.

Ecological relations are not really between two entities "given" independently, organism and environment. It is commonly thought that an environment surrounds, and therefore presupposes something—an organism—to be surrounded, with an "inside" (the organism) and an "outside" (the environment). But we can, instead, think of the environment as a network of lines, branching out and coming together at various points, and ramifying indefinitely, without hierarchies. An ecological relationship "cannot be an interaction between one thing and another, for that would be to suppose that they existed, as discrete entities, in advance of their mutual engagement. If organisms, in general, 'issue forth' along the lines of their relationships, then each organism must be coextensive with the relationships issuing from a particular source. It is not possible, therefore, for any relationship to cross a boundary separating the organism from the environment. If the concept of environment is to mean anything at all, it must refer to the interpenetration of organisms. This is perhaps easier to see in the case of persons, where we are used to using the word 'social' to denote the condition of interpenetrability. But just as

we need to be careful not to reify the social as an exclusive, higher-order domain going by the name of 'society,' we also have to avoid reifying the interpenetrability of organisms as a domain that exists apart from them, and with which they can interact, namely 'the environment.' In short, organisms no more interact with the environment than do individuals with society. Rather, ecological relations—like social relations—are the lines along which organisms-persons, through their processes of growth, are mutually implicated in each others' coming into being."

Ingold observes that traditional knowledge is generally associated with a genealogical model (that of the kinship diagrams), based on the idea that the elements that go together to constitute a person are passed down, from that person's ancestors, along lines of descent, which represent channels for the transmission of substance, which may be in part material, providing the recipient with a component of biology ("blood"), and in part mental, providing a complementary component of culture (a corpus of ideal rules, recipes and prescriptions). In this view, however, the environment is simply the backdrop of nature and it plays no part in the constitution of persons. "So long as the stuff of tradition could be passed along, like a relay baton, from generation to generation, it made no difference where the people were." Local traditional knowledge, however, "is not really 'passed down' at all. Rather, it is continually generated and regenerated within the contexts of people's skilled, practical engagements with significant components of the environment." It is not cognitive; it does not lie "inside people's heads." "It lies, rather, in the mutually constitutive engagement between persons and environment in the practical business of life." Tradition is not a kind of substance, it is a type of process.

Cognitive scientists think of the person in terms of container and content. "Equipped by nature with universal capacities, human beings are viewed as containers for the culturally variable, substantive content which specifies traditional knowledge in its diverse spheres of application." According to Ingold, however, local traditional knowledge might be better denoted by the concept of skill. Skills are not properties of the individual body; they are rather properties of the whole system of relations constituted by the presence of the agent in a richly structured environment. Moreover skills are refractory to codification in the programmatic form of rules and representations; they are learned through a mixture of imitation and improvisation in the settings of practice. "It would be wrong, then, to say of local traditional knowledge that it is 'cultural' rather than 'biological,' or in the head rather than in the body. It is rather a property of the whole human organism-person, having emerged through the history of his or her involvement in an environment."

Pier Giorgio Solinas, in chapter 20, notes that the relationship between knowledge and application is generally seen as hierarchic: first one knows and then one does. In fact, however, historic examples do not appear to confirm this presupposition. Solinas in any case declares himself pessimistic as regards the possibility of recovering indigenous knowledge. In the cases of critical transitions or revolutions, the new technical systems cannot tolerate the presence of two different kinds of knowledge, and the local one is swept away. "Of course after, but only after, com-

plete deculturation has taken place, those born into the new society may acknowledge and research their lost patrimony. However, the results are often prolix or artificial: a laborious revival ritual performed by a mimical mind." Solinas points out that nature knowledges do not only concern animals and plants, but also man and his reproduction, and he presents an example taken from his research into the Santal tribe, India, which reveals that it is not possible to separate the ideology of reproduction from the practice. "Ideology is not a cognitive premise to which we add a pragmatic extension. That which is between one and the other is perhaps a firm link of analogical coincidence, but not necessarily a stringent consistency. When a Santal has to explain why blood transmitted on a paternal line prevails over that of the maternal line, he will attempt to defend his own supremacy of belief rather than demonstrate the validity of his thesis. The fact is that the thesis in itself is proposed neither as an axiom nor as a provable statement, and in all probability is not limited to the circle of things that can be affirmed or negated, but is rather an accessory, an ethical and mental institution at the same time."

In chapter 21, late Michael Warren affirms that indigenous knowledge is a powerful ally in moving away from a transfer of top-down approach technology to a more participatory one. Indigenous knowledge "represents localized—sometimes ethnically-based or community-based—knowledge that has evolved within a micro-environmental context." Its counterpart is the global knowledge produced by the universities and by the research laboratories. Warren emphasizes that indigenous knowledge is always dynamic, reflecting indigenous approaches to changing sets of problems faced by any local community. It was for this reason that the term "indigenous knowledge" was introduced instead of the earlier "traditional knowledge," in order to avoid the underlying stereotypes of simple, static, and primitive that the term "traditional" carried with it.

Conservation

Cristina Papa gives a dynamic interpretation of conservation, placing the emphasis on the human use of environmental resources, which with controlled forms of manipulation, transformation, and domestication can be conserved and renewed rather than exhausted and destroyed: therefore, according to the definition adopted in 1991 by the International Union for Conservation of Nature (IUCN), conservation is "the management of the human use of organisms and ecosystems capable of ensuring that such use is sustainable." In opposition to this view, linking conservation with use, is the particularly significant adoption of a concept of conservation excluding human use: conservation as the preservation of a wild humanless environment, in a world where man and nature are basically considered to be antagonistic. Of course conservation is not a neutral category, but generates conflicts that oppose social subjects with different interests in the management of natural resources.

As regards the conservation of genetic resources, Papa defends the sustainable development projects that envisage *in situ* and on-farm conservation, which

implies the involvement of local populations. "In pursuing conservation their objective is controlled change aimed at increasing income and yield, without replacing the local genetic resources. Obviously the cultures (techniques, representations, and forms of learning), and the social and productive systems that have made the conservation of these varieties possible cannot be seen as immobile situations in the projects but rather as agents subject to change as part of more general transformations. Thus cultural change, instead of being exorcised, must be oriented towards a sustainability so that nature knowledge is developed and its transmission encouraged."

According to Papa, in the West the conservation of on-farm biodiversity by local producers can be targeted to the needs of the Western urban market, in the form of "typical," "quality" food products; thus local varieties become "traditional products," reflecting the transition from direct consumption and local markets to global markets. But it must be borne in mind that "the mechanisms to protect these local productions, however, lead to deep changes in the product itself and the local culture, by influencing their variability on the one hand, and their changeable nature as living material on the other," through a process of standardization of the food product and of the local culture itself that produces it, cutting them off from variability and from becoming historical and fixing them in a rigid, compact "typicalness.""In other words, a reduced simplified tradition is constructed in order to present a purported unchanging 'overall' continuity. This is then attributed with potential legitimacy and social recognition."

"Change is the rule of nature": according to Mauro Ambrosoli, this point of view better addresses human relations towards the environment. In chapter 22, Ambrosoli indicates the very dilemma of specialization: selection weakens the system. The botanical history of European agriculture is played out through the contrast between species and variety. The deliberate selection of seeds led to the elimination of the worst cultivars. Selected crops have advantages but are ambiguous: high-quality seed is more expensive and only suitable to the best soils; moreover this man-made selection causes a loss of germoplasm. This loss was balanced out by a continuous exchange of seeds from distant regions, from poor lands to fertile lands, which brought mountain seeds to the plains, and seeds from open fields to enclosed ones. The conscious exchange of seeds was practiced on a European and then on a world scale from the sixteenth to the nineteenth centuries thanks to the work of individual botanists, academic botanical gardens, and privately owned gardens. The peasant sector maintained its function of providing great quantities of local seeds for agricultural purposes and acted as a veritable bank of germplasm, which was necessary for any future development.

In chapter 23, Laurence Bérard and Philippe Marchenay point out the importance of the study of local agricultural products and foodstuffs. "Local food products are situated in a complex world of relations involving the biological and the social. An animal race, a cultivated plant, and a product such as a sausage or cheese are the outcome of an accumulation of knowledge, practice, observation and adjustments that must be seen in relation to the way they are represented. In short, they are objects heavily invested with many processes and meanings." A

policy of protection and conservation poses cultural problems that must be carefully assessed. Protection procedures end up restricting diversity, simplifying it, stabilizing it, standardizing it, all terms that are in contrast with the very notion of diversity. Furthermore, "by generating new technical, biological and cultural references and bringing new players onto the scene, regulation has been overlaid on the existing complexity. How and which players can best protect products in this context of variability and diversity?"

Stephen Brush, in chapter 24, proposes a criticism of the current idea of genetic erosion and of conservation biology, which "aims to save species' diversity by salvaging key fragments of wilderness. The intent of conservation biology is to save a domain for nature so that it can re-conquer the Earth's surface if and when human disturbance ceases, whether this be a century, a millennium, or longer." The theme of the loss of genetic resources of crops illustrates some of the challenges and conflicts of alloying social science and conservation. By the 1960s the idea of the destruction of local crop diversity by global processes was widespread. But Brush's research, carried out on potatoes in Peru, on maize in Mexico, and on wheat in Turkey, reveals that "improved varieties easily root themselves in peasant production without displacing local varieties or dramatically reducing their diversity." Biological diversity on farms persists for three different reasons: (i) environmental advantages of different types of cultivars with regard to local microclimates, (ii) risk management of crop failure, by providing a form of biological insurance against pests, pathogens, or bad weather; (iii) cultural value of local varieties, because of their taste and quality or symbolic meanings. Nor must we forget the role of the market, or rather the lack of markets: "our research on crop variety choice in Peru, Mexico, and Turkey, revealed that peasant households produce more diversity than is necessary or optimal given environmental and risk conditions. Overproduction of diversity may be explained by the cultural value of local varieties, especially taste and cooking qualities, but why haven't peasant households discovered the benefits from specialization and exchange, so that not all households need to produce a whole array of varieties? In fact, markets for local varieties at the village level don't seem to operate, and households which consume a particular variety must also grow it."

In chapter 25, Diego Moreno states that the "natural" resources are always historically conditioned in their own ecology by the practices adopted by the previous societies that have settled on the site over time. Environmental archaeology has demonstrated the historical nature and finiteness of environmental resources. "There is no primordial natural Eden in the European history of the last 10,000 years." Biodiversity too, on a local scale, reveals its nature as a "historical product," obtained, for example, through particular strategies of selective harvesting. In fact "the *local plant heritage* (this category allows us to deal not only with the domestic flora but also the putatively wild flora) is managed according to definite production strategies. Today they appear to be documented historically more by the environmental mechanisms introduced by production practices (and their previous effects), than by the sources conventionally referred to by historians of agriculture." A rich cultural, environmental and productive legacy (i.e., environmental

resources, practices, forms of knowledge and local plants and animal production) has been "unwittingly" conserved. "Only by adopting the historical ecology approach and the local history scale of observation will these environmental aspects of the European rural heritage be identified, recovered and correctly developed."

Finally, in chapter 26, Gherardo Ortalli reminds us that in the Middle Ages the very concept of conservation may have appeared decidedly anachronistic. Then, "the dialectical relation between man and the natural environment was thus determined by a powerful theological premise: since nature was created for man, there were no limits to its exploitation. These doctrinal bases paved the way to interpretations of the man-environment relationship whereby Christian anthropocentrism is associated with a consequent arrogance towards nature, considered to be completely subordinate."After the recovery of the year 1000 the issue of conserving resources began to be posed. With the twelfth century we register a growing number of objective forms of environmental protection, due to the needs of practical knowledge rather than any pressure from new ideologies: control of woods, protection of particularly valuable trees, obligation to plant new trees, limits on hunting, dumping dangerous or toxic materials, controls on polluting manufacturing processes. However "there had been a change of attitude towards the environment: the natural heritage was no longer seen as being inexhaustible," although the mediaeval conservation of resources followed a logical development which had little in common with safeguarding the environment: it was essentially a question of pursuing practical protection whenever required by contingent needs immediately perceived by a society with a very direct dependence on natural resources.

Ortalli invites us to reflect on the highly instructive case of Venice, which is primarily a city but strongly marked by natural elements (water, lagoon, canals, tides and islands)."Venice has always been characterized by its fragile equilibrium of water and land, built on a refined system of knowledge founded on the continuous and exact measurement of the tide, the relation between salt and fresh water, the influence of rivers and their deposits, the necessary and functional co-existence of islands, *barene* (the flat emerged grassy mud banks in the lagoon only ever covered by very high tide) and *ghebi* (narrow vein-like channels). These forms of knowledge have always played a key role in the survival of the lagoon equilibria. Without them, today the lagoon would not be what it is." These equilibria have been governed for centuries through the integration of different kinds of knowledge: both theoretical and experimental, and erudite and popular, organized over the centuries in various organs of control which gradually came together in the institution of the Magistrato alle Acque, which until just a few years ago decided on issues concerning the lagoon, "listened to the opinion of nine fishermen, something that shows how these different forms of knowledge were interwoven. "This would seem to be an excellent example of how knowledge produced by research institutes dialogued with empirical information from people with daily experience of life in the lagoon and fully aware of all its vital rhythms."

In the 1980s the state entrusted the monopoly management of the lagoon to a consortium (the Consorzio Venezia Nuova), bringing together some of the major private operators in Italy in the field of large public works. "The leap in the logic of the various forms of knowledge may be illustrated in the transition from experimental knowledge, including that of the fishermen, to the mathematical models used by the consortium." Naturally the interventions proposed to control the phenomenon of "acqua alta" are radically different: the scientific culture based on the local knowledges tends to put forward "gentle" solutions of minimal but continuous adjustments to the natural balances aimed at accompanying and guiding the ongoing evolutional processes; while the scientific culture expressed by the private consortium frames the problem in an engineering perspective of large-scale works and incomparably higher (and more costly) levels of technical intervention. We thus see once again the "contrast between traditional widespread forms of knowledge developed in the local context and those produced by general epistemological processes and introduced to the city from outside through procedures with considerable social and economic implications."

Conclusion

One theme dominated the conference, that of universals, authoritatively proposed by Brent Berlin. The idea of innate cultural universals, localized in the mind, aroused suspicion and reservations, especially in its most rigid formulations characteristic of cognitive scientists. The theoretical existence of universal features is not so much disputed as is their practical relevance; most anthropologists are more interested in culture-specific features, of varying import, whether local or transcultural—features determined by means of transmission (orality, literacy), modes of production (hunting-gathering, pastoralism, agriculture), and linguistic families. In any case, just as the belief in the theory of universal models does not mean a return to structural anthropology, so too its rejection in favor of culturally conditioned models has not meant a return to cultural relativism.

Another widely debated theme was that of the arbitrariness of the linguistic sign, as opposed to phonosymbolism and other hypotheses of "external" motivation of language.

The theme of indigenous, local, and traditional knowledges, and their rediscovery and re-use, was examined in depth; there emerged a certain uneasiness, both theoretical and practical, as regards the actual import of these concepts and the effective viability of projects linked to them. Nonetheless, there was much insistence on the historical and dynamic nature of local knowledge and of the natural resources themselves, and on the difficulties that this implies with respect to conservation and protection projects, which must avoid the contrasting dangers of rigidity and mummification on the one hand, and on the other that of a dynamic conservation that may simply be a disguise for a development artificially induced from without. But if nature is historical, what is a "natural" conservation? A *laissez-*

faire or a guided transformation? And what is the relationship between transformation and development?

If nature is a historical construction due to human activity, to the interaction of man with his environment, this opens the great question of rights over nature: legally nature would no longer be *res nullius*, and its exploitation would thus not be the exploitation of a thing, but of the men and cultures that have constructed it over time. In this case other major legal problems would seem to arise: a nature that is "historical" and no longer "natural" would cease to belong to everybody (to the whole world) and would become the property of *someone*—the collective property of only the local community that has "brought up" this nature. These are the themes that are becoming central to the debate on the rights to biodiversity, its exploitation and its conservation.

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