Images of Thought and Their Relation to Classification: The Tree and the Net

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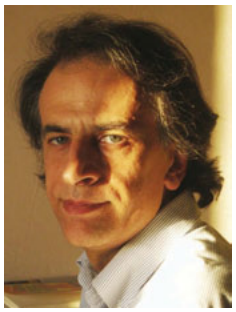

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ABSTRACT: This article takes a look at how images have been used through history as metaphors or models to illustrate (philosophical) ways of thinking with a special focus on figures of the tree and the net. It goes on to look at how classificatory thought depends on the epistemological framework in which it originates. Also examined is the Western model of classification and how it has favoured the logic of the tree, whose limitations are becoming increasingly apparent. The image of the net is then used to portray (as a pluriverse) the cognitive space of human knowledge, and a culturally-biased view of classification is upheld. Finally, some arguments are put forward to reformulate this view on the basis of an approach that combines epistemic and conceptual pluralism with a weak realism.

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1.0 Introduction

The nature of knowledge and the search for strategies to put that knowledge into a kind of order have been continuously explored throughout the history of thought. To this end different images and metaphors have been used and two of these, namely the tree and the net, have played a paradigmatic role. The tree has been epitomized by the "Tree of Porphyry," an iconic figure elaborated through the Middle Ages as an interpretation of Porphyry's introduction (*Isagoge*) to Aristotle's *Categories*. This image has had a strong influence on logic and philosophy, and it has been historically associated with "strong" epistemic approaches, implying, for example, realism and essentialism. It has had also an enormous impact on how the organization of knowledge and its visualization were conceived.

Over time, and above all from the sixteenth century onwards, new images were devised to emphasize a more reticular character of knowledge. These images include, for example, the map, the labyrinth, and the net. More recently, the contrast between arborescent and net-style structures has especially been brought to light by Deleuze and Guattari (1987). Their concept of rhizome became one of the symbols of postmodernism and has been compared to epistemic approaches emphasizing the contingent nature of knowledge (e.g., Sim 2001). The tree–net distinction still provokes heated debates. Explicitly or not, it features in a number of major issues of our contemporary culture, library and information science included (Robinson and Maguire 2010).

In this article, I begin by examining how the figures of the tree and the net as rhizomes or as networks have been used to represent different kinds of thought and views about knowledge. I then investigate how classificatory thinking depends on the epistemological background from which it developed. I look at how the logic of the tree influenced Western classificatory thinking and what contemporary criticism has made of it. Next, I use the image of the net from a different perspective to represent, as a kind of pluriverse, the multidimensional cognitive space of human knowledge. I argue in favour of pluralism in classification that is justified in terms of what is culturally possible. Finally, I suggest a few ideas to reformulate this view, on the basis of an approach that attempts to in-

tegrate epistemic and conceptual pluralism with a weak (or perhaps minimalistic) version of realism.

2.0 Arborescent and reticular images of thought

2.1 The tree

The origin of the tree image can be traced back to the Arbor Porphyriana. Porphyry (ca. 234–305 A.D.) in *Isagoge*, his short (didactic) dissertation on Aristotle's *Categories*, followed the method for accomplishing the right division from the supreme genera (or categories) to the individual species, which Aristotle described in the *Posterior Analytics*. The branching tree became the iconic representation of the hierarchical order developed from the supreme genus of Substance, obtained by means of a series of bifurcations. At each level, the essential "differentia," i.e., the defining (and immutable) characteristics that all instances of a "class" must have, are set up. When added to a generic class, two mutually exclusive (lower) classes are created (see fig. 1 of the introduction to the Special Issues). In Porphyry's case, the tree has to be understood mainly in logical terms, and in the Middle Ages it was also interpreted metaphysically. The idea of a finite and hierarchical order of the world with a unique tree for substances is implied here. On the other hand, the pure logical device thesis seems to allow for alternative ways of organizing differences, and then developing hierarchies. However, as Cornea (2009) argued, such alternative approaches should have above all a didactic meaning. It is hardly likely that Porphyry, who was a Neoplatonist philosopher, or many other philosophers before the Empiricists and Kant, would entirely separate logic from ontology. They see a homology between the world and the logos, an assumption that can be traced back to the Parmenidian statement "it is the same thing to think and to be."

The tree figure embodies the presumptions that there is: i) an objective reality existing independently of us; ii) a single legitimate categorial system; iii) a unique set of essential properties, and consequently a unique way of dividing the world into kinds; iv) Epistemologically, it involves the possibility of reaching the Archimedean point from which to view reality as it "really is."

The Arbor Porphyriana is seen as a representation of "strong thought" because these assumptions have been incorporated into the philosophical thesis called metaphysical realism, and contributed to the formulation of the traditional view of knowledge as "true and justified belief." Such a view embodies another basic assumption, namely "objectivism about justification." Epistemic facts, i.e., facts about what it is reasonable to believe given the evidence, are independent from the contingent interests and needs of any community. There is only a single set of fundamental epistemic principles. These are universally valid and lay down the basis of what can be legitimately labeled "evidence" (Boghossian 2006).

This view has played a dominant role in the development of Western thinking. A reason for this is because it has been incorporated into the epistemology of modern (Newtonian) science. One of the ideals of scientific knowledge is objectivity, which is pursued by separating the knowing subject from what is known, and facts (objective empirically testable knowledge) from values (pertaining to the dimension of subjectivity) (Bernstein 1983). Modern science aims to unravel the universal laws of nature and society, which transcend space and time, and form the order of the universe. For the purpose of this article, the image of the tree is also used in this wider sense to represent positions that, simplistically, share the belief of a single (intellectual) viewpoint being universally valid.

2.2 The net as a rhizome

The tree structure (and many of its epistemic implications) has dominated Western thought for a long time. It has been portrayed at different levels and, starting from Bacon, used as a paradigm of reference for the classification of knowledge and later taxonomic enterprises. At the same time, especially from the sixteenth century, the tree figure evolved into a more complex structure. New images, like the labyrinth (by Bacon, Leibniz, Diderot, and D'Alembert) and the map (by Chambers, Diderot, and D'Alembert), surfaced. This occurred also because knowledge was laicized following the Enlightenment and its encyclopedic projects. A more reticular character of knowledge came into being.

In our contemporary age, the idea of a (multidimensional) net has been formulated along the lines of Deleuze and Guattari's rhizome (1987). This is an image borrowed from botany and used to explain language, text, politics, etc. The rhizome became one of the symbols of postmodernism and has to be understood in the context of the innovative thinking of Deleuze and Guattari's avant-garde philosophique. Their project had an emancipatory purpose with the aim of disentangling ourselves from the dominant (and paralyzing) logical-linguistic superstructures, which had prevented the free movement (and creative recombination) of ideas. The rhizome was contrasted (not however as its opposite) with "arboreal thinking." The latter puts identity before difference, subsuming particulars under abstract universals. It involves the "arborification of multiplicities," meaning that these are structured according to pre-existing patterns that reduce the chances of association. On the other hand, rhizome-like thought advocates a free flow of singularities and multiplicities, putting difference before identity.

In *A Thousand Plateaus* (1987), Deleuze and Guattari explained their idea of rhizome according to six closely interlinked principles. The first, "connectivity," asserts that any point of a rhizome can, and must be, connected to any other. It fosters an experimental (and radically open) model of connectivity in systems of ideas, which can be organized in countless ways, according to immanent and non-exclusive (even alogical) associations that are constantly transforming. The principle of connectivity has, however, to operate in strict association with the second principle, i.e., "heterogeneity." Unlike arborescent structures, rhizomes function like open-ended systems in which heterogeneous elements can be connected. Semiotic chains of a different nature can be linked to other types of coding, e.g., biological, political, economic. The third principle, "multiplicity," means thinking of multiplicity without imposing on it an overcoding dimension (e.g., a unifying concept) which transcends it: "it is only when the multiple is effectively treated as a substantive, 'multiplicity,' that it ceases to have any relation to the One" (Deleuze and Guattari 1987, 9). Rhizomic wholes are made up of nothing more than the dimensions in which they dwell. They are multiplicities that exist on a "plane of consistency," which holds them together and "is the outside of all multiplicities."

Tree-like thought implies setting boundaries and limits. Establishing of an internal structure also brings about the formation of an outside. "That which is not" is created. Instead the boundaries or limits of rhizomes can never be clearly drawn. Rhizomes are intrinsically open in all directions and are always part of a bigger picture. Take the botanical rhizome: an underground root system connects itself to other root systems and spreads out in all directions. Rhizomes do not exhibit any permanent identity. There is no discernable beginning or end point, and there are no privileged parts either. The metaphor of the rhizome also undermines the belief that a clear distinction between the traditional concepts of subject and object can be made.

Although constantly engaged in a struggle with processes of re-centering, hierarchization, and signification, rhizomes are not organized around a controlling center, hierarchy, or structures of signification. There are two tendencies flowing in opposite directions which are constantly antagonistic to each other. This is also explained in the last three principles. The fourth is "asignifying rupture." Rhizomes contain both lines of signification, or territorializations, and lines of rapture, or deterritorializations, which are always interlinked, "caught up in one another" (ibid., 10). They are constantly in the process of "becoming," and each becoming can simultaneously bring about the deterritorialization of one thing and the reterritorialization of another. "Cartography" and "decalcomania" are respectively the fifth and the sixth principle. Rhizomatic connections do not involve "tracing," i.e., representing (or replicating) something preexisting. Tracing belongs to the logic of the tree, which imposes its genealogy and entails a filiation, a genetic axis as the one and only point of entry (based, for instance, on a single categorial system). On the contrary, the rhizome is anti-genealogical and it "has multiple entryways" (ibid., 12). Its links are formed through mapping: a map is not tractable with a genetic model, but rather is something which is "oriented toward experimentation in contact with the real" (ibid., 129). As such, it has to be produced and is never finished, being subject to continuous modification and adaptation.

Not only can every point be linked to other point, but this process of connecting can also trigger off global, holistic transformations, as far as punctiform changes (e.g., a new link) can result in an alteration of the whole system. The rhizome is a kind of unlimited territory that is not manifest in things, but rather constitutes a latent potential that has to be actualized. An (ontological and epistemological) constructivist view seems to be implied here: "The diagrammatic or abstract machine does not function to represent, even something real, but rather constructs a real that is yet to come, a new type of reality" (ibid., 142).

Umberto Eco (1984) used the image of the rhizome to describe his idea of the labyrinth-as-a-meander, in direct contrast with the Porphyrian tree model. The universe of semiosis and human culture is portrayed in such terms. What typifies a labyrinth of the kind is that only local (situated) views, not global ones can be obtained. The only possible (epistemic) rule here is described in terms of the mathematical metaphor of the "myopic algorithm" (Rosenstiehl 1980), with a myopic observer-traveller only able to access information that is available locally. Besides, if every point can be linked to every other point then dead ends (and mistakes) seem impossible (Cornea 2009). Not only are they unlimited, but also the simultaneous occurrence of mutually contradictory, cognitive paths, and descriptions become feasible. These are not seen as incompatible: in the rhizomic labyrinth the authority of the non-contradiction principle is somehow relaxed. The universe (of knowledge) turns out to be a pluriverse.

2.3 The network and its relation with the rhizome

Another currently popular net-style image is the network. It is used to refer to wholes of highly interconnected parts and is applied to a variety of domains, from the physico-chemical to the social and the political. Unlike hierarchical (arborescent) and linearly ordered organizations, networks are open and participative systems, with a distributed control and a higher capacity to adapt and evolve (Coyne 2008). They can be compared to self-organizing ant colonies that Deleuze and Guattari used as models of animal rhizomes. Undoubtedly, there are similarities between net-

works and rhizomic systems. Both share a number of basic features and exhibit non-linear and unpredictable dynamics. However, the network is not the same as Deleuze and Guattari's idea of the rhizome.

A network is a topological object and from a mathematical standpoint it is a type of graph, i.e., a set of nodes and connections. Whereas a tree is a graph with no cycles, complex networks are made up of loops. These represent an important aspect of the organization of certain systems. Loops are scientifically studied in first order cybernetics and systems theory (homeostatic feedback loops), as well as in second order cybernetics, autopoiesis, and complexity theory (self-referential loops). They are implied, for example, in the mechanism by which complexity arises from simple rules, if applied reiteratively (e.g., Taylor 2001).

There is a difference between the "holism" of the (actual topological) network, which entails global organizational principles based on emergence and a circular causality, and the idea of the rhizome, which is more inclined to indeterminacy and fragmentation. The concept of network still presumes a hypothetical connectivity and unity in things, and is explained in terms of scientific theories and generalizations. The rhizome is instead against generalizations, including using the network and its general properties to explain nature: "Nowhere do we claim for our concepts the title of a science. We are no more familiar with scientificity than we are with ideology; all we know are assemblages" (Deleuze and Guattari 1987, 22). Just like universal trees, no universal networks are admitted. In rhizome thought everything is surface. Since a rhizome has no beginning or end, and is "always in the middle" (ibid., 21), it is difficult to think of loop dynamics as its most characteristic and defining property (Coyne 2008).

The relationship between the rhizome and the network at an epistemological level might be compared by (partial) analogy to the difference between postmodern thinking and (the epistemology of) complexity. The latter emphasizes the contextual nature of knowledge and entails a (scientific) form of constructivism (e.g., Morin 1986). Whereas modern science's approach is based on an attempt to eliminate any subjective interference, in the case of complexity the "observer" is seen as an intrinsic part of how we acquire knowledge. Humans (as observers) only understand the world from their domain of experience, which cannot be transcended (being however systems involved in interactions and complex relationships with the environment and other systems) (Taylor 2001). Accordingly, multiple (observer-dependent) descriptions of natural systems are admitted and even encouraged. Instead of searching for one fundamental point of observation, scientists need to explore multiple (and yet potentially compatible) viewpoints, e.g., disciplinary perspectives, which may complement one another when describing or explaining a certain phenomenon or system (Ceruti 1994). For Rosen (1985), complexity is the property of a system which is manifest in the fact that a single formalism capable of accounting for all its properties does not exist. Multiple formal descriptions, which are not derivable from each other, are required for such a purpose. However, acknowledging the importance of "multiple" descriptions does not imply that "all" descriptions are possible or regarded as having an equivalent value. Complexity embraces a (post-metaphysical and anti-reductionist) ontological view that emphasizes the role of self-organization. The world is seen as a highly interconnected (or co-constructed) whole. It also favours a (weak) epistemological position that acknowledges the value of pluralism precisely because the complexity of nature is beyond the comprehension of a single perspective.

I am inclined to think that the (postmodern) presumptions implied in the rhizome image are more radical. They could be associated with views that deny an epistemological privilege over any belief system and which refuse to adhere to any fixed ontology: there are many different, and equally legitimate, forms of interpreting reality, as well as different sets of "epistemic" principles and perhaps many possible worlds. Postmodern discourses are marked by an engagement with deconstructive strategies whereby the socially constructed bases of dominant positions, Western science included, are unveiled and undermined.

This view is usually seen as involving an epistemic relativism, and, for this reason, it is accused of being self-referentially inconsistent and paradoxical. The thesis that "only local descriptions are possible" (or that "there does not exist any absolute truth") seems to fall into the trap of self-confutation. In fact if this claim has to be understood in absolute terms, there is at least a single absolute statement, in which case the relativistic thesis is contravened. At the same time, there is the risk of a regressio ad infinitum if this thesis is applied to itself (Boghossian 2006).

3. Epistemology and classificatory thinking

3.1 The tree and the net in Western approaches to classification

The urge to classify is deeply embedded in human cognition. Our way of dealing with reality and ordering it is based on this. The world is divided into kinds, and conceptualization implies classification. The organization of knowledge for theoretical or pragmatical reasons is based on classification schemes. What is explored here is the relation between epistemology and classification. Tacitly or not, classificatory thinking and practice depend heavily on the underlying (ontological and) epistemological foundations (being however also a means of reinforcing them).

In Western culture, the tree structure based on Aristotle's logic has been the dominant model of classification.

As mentioned earlier, this model is characterized by the grouping of entities into categories according to shared sets of properties. These have been identified as their most distinctive (or essential) properties. Olson (1999a) has condensed the theoretical frame of such a model into three basic principles: i) (mutual) exclusivity, ii) teleology, and iii) hierarchy. A similar scheme has been incorporated into scientific taxonomic thinking (e.g., the Linnaean classification system in biology), and is still present in many contemporary semantics theories, e.g., in "dictionary semantics" (Eco 1984) or Chomsky's sentence diagrams, as well as in the dominant approach to designing knowledge organization systems, such as bibliographic classifications, thesauri, and ontologies.

Nevertheless this approach has been criticized at different levels. For instance, Eco (1984) wrote of the logical untenability of the classificatory (genus-species) tree to represent the structure of knowledge if intended as univocal and necessary. Multiple hierarchies can be developed as long as the organization of differences depends on one's own particular viewpoint. And if this is the case, the tree structure collapses into a net or rhizome. On a different plane, but still worth mentioning at this point, are positions arguing for an ontological pluralism, such as Dupre's (1993) promiscuous realism. In his view, the world is made up of a multidimensional complexity; things are interconnected and interrelated to one another in multiple ways; there is no unique way of carving nature at its joints; and this complexity cannot be encapsulated into a single, universal way of classifying.

To understand this criticism, it is also important to put it in context as a part of a new cultural milieu. This grew out of groundbreaking theoretical findings from the XX century that, directly or not, have had also an impact on classificatory thinking. For instance, different kinds of (polyvalent) logic have been formulated through the work of innovative thinkers such as Lukasiewicz, Gödel, and Zadeh. Such changes in logic came about also in response to the developments of quantum mechanics. This is especially true of Bohr's principle of complementarity which challenged the idea of mutually exclusive categories. Hermeneutics and post-positivist epistemology highlighted respectively the historicity of understanding and the incommensurability of alternative scientific theories. On the other hand, postmodern thinkers have argued for the breakdown of grand narratives and the need to embrace a pluralistic view (an introductory account of this new milieu can be found in Ceruti 1994 and Taylor 2001).

More recently, the creation of hypertext and the web has brought about the diffusion of a net-styled culture, information organization (and perhaps mental pathways). The qualities of the rhizome have been compared to the non-hierarchical and nonlinear environment of hypertextual information systems (e.g., Landow 1997). At the same time, the web is portrayed as a rhizomorphic labyrinth. It is a sort of Borges's Library of Babel, made up of nodes (web pages) and links, where each node can be linked potentially to a countless number of other nodes. A multiplicity that cannot be handled under any pre-established order.

Rhizome thinking and the web culture seem to be reflected in one another. However, quite paradoxically, the web acts also as a powerful standardizing machine at different levels (e.g., Buchanan 2007). This might suggest that we are still living in a world that is the result of our (cultural) history, and that the rhizome follows the same "pattern of development" of as the tree. Without the latter there would not be the former. The tendency towards abstraction and universalization is ingrained into our mindscape, and nurtures criticism about them too.

3.2 Cultural biases and pluralism in classification

In the following section, I have used the figure of the net from a different point of view to represent the "cognitive space" of human knowledge as a kind of pluriverse. A multidimensional net or rhizome is portrayed as an illimitable territory. However, multiple local actualizations can arise from this, in the same way as multiple knowledge systems of different cultures emerge from the range of possibilities of the human cognitive space. Many worldviews, ways of thinking (including methods to acquire, verify, and organize knowledge), and systems of values have been created so as to understand the world and enable us to live in its many different environments.

However no local systems, i.e., particular sections of the pluriverse that can be represented as trees, has the right, at least in principle, to claim any universal validity or supremacy. To show this, we would need to advance some arguments demonstrating that one knowledge (or epistemic) system is objectively superior to the others. But any such argument would require using (the principles of) a knowledge system. Since a universal or neutral metasystem is not available, each contendent would naturally use their own systems to carry out this analysis. However by using one system over another for such a demonstration, we have already taken for granted that it is superior, i.e., that system is correct and others are not. In other words, what must be demonstrated is presupposed. Besides, each system would very likely "decide in favor of themselves and against the other practice" (Boghossian 2006, 77). Justifying a system through the use of that system is a form of circular reasoning.

Any classification can be seen as a reflection of the basic codes of a culture, meaning that different orders can be imposed on the world as a result of different ways of

looking at it (Foucault 1970). Classifications exist because boundaries are projected on things. This implies that if we are to "view" something, something else has to be excluded. An investigation into other ways of ordering reality or knowledge might, therefore, become an opportunity to grasp the limits of our understanding. Our way of looking at and classifying the world is decentralized, and becomes just one of the many possible ways.

In the West, scientific knowledge is highly reputed. For example, natural kinds discovered by science tend to be seen as real and play a key (epistemic) role in scientific explanations. They are capable of interacting causally and, as scientific entities, are the result of extended periods of adaptation, adjustment, and change (Feyerabend 1989). Nonetheless, there have been in different historical ages and cultural settings alternative ways of describing the world and dividing it into distinct parts. Any human community has to survive in and therefore adapt to its world (also by means of its classificatory practices and systems). The way in which experience is structured and conceptualized has to guarantee a success in this endeavor. The possibility (and the actual existence) of multiple descriptions and classifications is also due to the fact that they have offered and still offer a meaning to the lives of those people using them, and a basis for survival and co-adapting in their world-environment (Mazzocchi 2011).

Whereas Western classification tends to follow the Aristotelian or other Western kinds of logic, alternative ways of classifying have developed along other culturally biased (ontological, epistemological, and logical) presumptions. In Durkheim and Mauss's view (1963), they depend also on the social and political organization of the particular society. When we look at these other cultural settings, especially at non-Indoeuropean cultures, (even radically) different sets of classificatory principles can be found. Interestingly, Deleuze and Guattari also looked at the East when they compared their rhizome to the tree figure. The latter is seen as a reflection of the "regrettable characteristic of the Western mind" to see things metaphysically. And nonetheless, "Does not the East ... offer something like a rhizomatic model opposed in every respect to the Western model of the tree?" (Deleuze and Guattari 1987, 18).

3.2.1 Classification in non-Indoeuropean cultures

The principles of non-contradiction and tertium non datur, and then the idea of mutually exclusive categories, have formed the basis of the Western idea of rationality. However, other ways of thinking have refused the logic of binarism or limited its influence only to given contexts. For example, Taoist thinking conceives its "way" as an unfolding between (pairs of) opposites, which constantly transform into each other. What really matters is precisely such "in-between space" (Jullien 2006). This involves another kind of "logic" aimed at preserving the conjunction and complementarity of opposites.

Classic Chinese schools of thinking do not follow the prescription of universality that the Western thought has inherited from Greek philosophy. The latter assumes that any legitimate knowledge (or science) has to discover some unitary principles, e.g., universal laws or essential properties of things, underlying diversity and multiplicity. The former see instead any determination or adoption of any specific perspective as a denial (of what is not included in it) or an artificial freezing of the incessant flow of nature. The "great reality" (tao) cannot be reduced to isolated objects or essences, or accounted for by distinct and static definitions (Jullien 2006). Just like water, it does not exhibit any specific form. Its only characteristic is that it shuns characterization. Whereas the development of grand systems (of thought, religion, classification, etc.) characterizes the West, it should not be a surprise that in classic Chinese culture there is the tendency to make use of unfinished "sketches." Their purpose, in fact, is not to "represent" or comprehensively describe, but rather to "allude" to the undifferentiated source and plenitude from which everything constantly arises and in which everything is reabsorbed (Jullien 2006). At the same time, the notion of natural order is typified by the fact that the uniqueness of any constituent particular is constitutive of the order itself. A sort of aesthetic order is searched for in which things can be harmoniously related. From this derives also the belief that things can be sorted in many different ways, depending on the context.

Hall and Ames (1998) highlight the importance of analogical (or correlative) thinking in classic China. This way of thinking makes great use of "association of significances into clustered images" (ibid.) that are treated as holistic meaning complexes. Analogical thinking is manifest, for example, in the creation of tables of correspondences. The latter collect sets of items in the natural and social spheres that are capable of supplying a purposeful context to the lives of individuals. For example, the "tables of five," during the Han dynasty (206 BC - 220 AD), compared "the five directions," "the five phases," "the five colours," "the five notes," etc. More generally, the pervasiveness of analogical thinking impacts on the way in which knowledge is gained, organized, and transmitted:

There is a stark contrast between these Western models of classification and the one characteristically found in the traditional *leishu* (encyclopedic or classificatory works) of China. Chinese "categories" (*lei*) are defined not by the presumption of a shared essence defining natural "kinds," but by an identified functional similarity or association that obtains among unique particulars. Definitions are not

framed in the terms of essential features and formal class membership; instead, definitions tend to be metaphorical and allusive, and invariably entail the human subject and human values (Hall and Ames 1998).

Indigenous classifications are another example of how a holistic "perception" leads to a different way of classifying compared to the more analytically oriented Western approach. These classifications cannot be understood without referring to the non-dualistic worldviews of indigenous people. Everything in nature is seen as holistically linked and interdependent. There is no nature – society distinction for example, and an intimate connection between knowledge and the knower is taken for granted. Time exhibits a circular character and nature is in a constant cyclical transformation. As a result, their knowledge structures and classifications favour integration over mutual exclusivity and circular patterns rather than linear teleology. They are more inclined to highlight context relations and localism than universal generalizations and hierarchy (Olson 1999b). Indigenous classificatory practices and biotaxonomies do not follow highly formalized methods but seem rather to require a certain degree of ambiguity. Randall (1987), for example, asserted that the structure of indigenous biological classification resembles what could be depicted in Western terms as a prototypal approach fostering a graded categorization. What is implied here is a perceptual network that, rather than establishing necessary and sufficient conditions for category membership, is based on a focal-peripheral structure. Depending on the features involved, the elements of a category do not have an equivalent status but range from a central nucleus to those that are included at peripheral positions.

4.0 The multiplicity viewpoint is not enough

Pluralistic views of classification and knowledge emphasize their culturally constructed nature. As the previous sections have shown, I am sympathetic to this way of thinking, as well as the many arguments used to contrast epistemic absolutism. The latter mistakes what is historically or culturally stable for what is permanent or natural. There is no ultimate system of categories. Changes in the cultural conception of classification are not necessarily directed towards a logical (Western-biased) way of classifying (Olson 2002). The heuristic legitimacy of the fundamental place of observation lost favour and has been replaced by a belief in a non-reducible plurality of viewpoints and systems of thought.

At this point I would like, however, to offer some thoughts on how to reformulate this view in the light of some counterbalancing considerations. Two different kinds of opposite positions need to be avoided here. A sort of cognitive reductionism, whereby differences occur only on the surface, is just one side of the coin. The flip side is a "metaphysics of multiplicity" which fragments humanity into many "cultural islands," i.e., closed and static systems separated by impermeable barriers, or a multinaturalism that denies the fact that there is an inherent human nature.

I endorse an approach that attempts to combine pluralism (without necessarily believing that all systems are equally valid) at epistemological, classificatory and conceptual levels with a weak version of realism. I have described this as a constructive realism to indicate a dialectic tension between realism and constructivism (Mazzocchi 2011). "Our" world, i.e., the shape of the world we "see" and in which we live, is in a sense relative to us (i.e., to a given culture). A multiplicity of culturally-biased "world-versions" could exist. Nevertheless the possibility of developing them still depends on the existence of something beneath them, functioning as their source and not itself a version. This dimension can be seen as highly flexible but it cannot be forced into whatever any structure. It is not inert (as enclosed in itself) but offers resistance, and is capable of interacting dynamically. Although there may be different ways of adapting to this resistance, the latter limits the ways open to us to describe or classify reality. Many but not all of them are possible or produce the expected results.

These realistic assumptions are, therefore, minimalistic. From a given standpoint, such a resistance is what can be grasped of reality. This implies also that our "access" to reality is somehow indirect. We came to know its lines of resistance, which in a sense are also its "responses." But these too are not "brute facts." To acquire any meaning, they still have to be deciphered in the light of a given (situated) perspective. However on the one hand reality offers resistance to our constructions and somehow guides them. On the other hand it also operates within us and through us, we who are (part of) the world. Self-consciousness triggers a process of separation for which we become subjects in contrast to an objective world outside us. And yet reality-as-a-whole contains both dimensions. It is both the object of our investigations, and (in the) the subject carrying them out. From this angle, reality is not relative to us but rather it includes us. The world is (formed or constructed) in the observer's mind, and yet the observer's mind is (formed) in the world. Our cognitive organization has developed throughout the history of nature. A (structural) correspondence between the organizational principles governing the universe and those inherent in human cognitive structures is feasible. The possibility of developing "fitting" representations or descriptions of the world should also be related to this (Morin 1986).

This brings us to the question of who we are and how we operate as human beings. There should be something in common among all cultures if all are an expression of the same living species. This "life form" (Wittgenstein

1958) allows humans to share spontaneous common reactions and to a certain extent communicate and comprehend each other, revealing itself in our fundamental biological properties and mental patterns. These include the basic cognitive schemes on which perception and conceptualization depend, involving processes of categorization. It might also include how human memory basically operates, both transversal (associative) and vertical (hierarchical) pathways are involved, despite the differences between oral and written cultures.

The multiplicity of cultural patterns emerges from this basic life form. What has to be investigated is how this fundamental sameness can be combined with epistemic pluralism or with different (culturally-biased) models of rationality.

5.0 Conclusions

In conclusion, I return to the images I have used throughout this article. The multiplicity of the different forms of knowledge can be portrayed as creating a networked pluriverse. In this multidimensional cognitive space, innumerable ways of establishing order are possible. Unexplored connections can be constantly discovered and new knowledge generated by bricolage or cross-cultural hybridization. And yet, this does not mean that every cognitive path is feasible, or that all paths have an equal value. Reality offers resistance. However there is no need, at least in principle, to search for a universal order as a way of understanding the world in unitary terms. Other cultures have looked at it differently and still flourished over the centuries. Any cultural understanding of reality is structurally limited to what is visible from a given perspective. And nonetheless, we can still enrich ourselves and expand our cognitive space by learning to shift our viewpoints (e.g., Mazzocchi 2006).

This view aims at integrating the multiplicity (e.g., the pluriverse of knowledge, the multiplicity of culturally-biased world-versions) with the unity (e.g., an underlying reality, a common life form) dimensions. In a sense, this may also be seen as an attempt to go beyond both the tree and the (net-as-a-)rhizome. These images have in fact been used to represent respectively universalist intellectual viewpoints and the fragmentation (into an unlimited multiplicity) of postmodernism. While different individuals, societies and cultures occupy different niches, they all belong nevertheless to the same world.

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