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Gregory Bateson's Ecology of Mind and the Understanding of Human Knowledge

Abstract

Departing from the biological notion of ecology that pertains to mutual relationships between organisms and their environments, this paper discusses theoretical foundations of research on the nature of human mind in relation to knowledge, cognition and communication conducted in a broader context of social sciences. It exposes the view, explicitly formulated by Gregory Bateson, that the mind is the way in which ideas are created, or just the systemic device for transmitting information in the world of all living species. In consequence, some crucial points of Bateson's reasoning are accentuated, such as the recognition of the biological unity of organism and environment, the conviction of the necessity to study the ecology in terms of the economics of energy and material and/or the economy of information, the belief that consciousness distorts information coming to the organism from the inside and outside, which is the cause of its functional disadaptation, and the like. The conception of the ecology of an overall mind, as the sets of ideas, notions or thoughts in the whole world, is presented against the background of theoretical and empirical achievements of botany and zoology, anthropology, ethology and psychiatry, sociology and communication studies in connection with the development of cybernetics, systems theory and information theory.

Keywords: consciousness; ecology; ecosystem; knowledge; mind.

On Ecology, Ecosystem and Ecologism in Natural Sciences and Humanities

To familiarize the potential readers with the term *ecology* (Germ. *Ökologie*), it might be helpful to recall the fact that it was used, for the first time in 1866, by Ernst Heinrich Haeckel (1834-1919), a German zoologist and philosopher of evolution (cf. Haeckel, 1988 /1866, p. 286). The proponent of this term occupies therefore a stable place in the historiography of biology as an advocate of the evolutionary theory of changeability of species in nature promulgated by Charles R. Darwin (1809-1882). Slightly later, as cited by Winfried Nöth, 1998, p. 332 and Elzbieta Magdalena Wasik (2010, pp. 73-75), the notion of ecology found a practical application in the studies of interactions between organisms, populations and their external environments, conducted by physiologists of plants and animals who worked in the United States and Europe at the beginning of the 20th century.

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Among renowned ecologists, one has to list here such scholars, as, for example, Frederic E. Clements (1874-1945), Aldo Leopold (1887-1948), Alfred Lotka (1880-1949), Eugene Odum (1913-2002), and George Evelyn Hutchinson (1903-1991). In this context, illustrative are, among the other titles, for example, *Fundamentals of Ecology* (1953) by E. Odum, *Nature's Economy: The Roots of Ecology* (1979) by Donald Worster, *History of American Ecology* (1977) by Frank N. Egerton, and *The American Development of Biology* (1991 /1988) edited by Ronald Rainger, Keith R. Benson and Jane Maienschein. Ecologically oriented biologists have conducted research to substantiate the hypothesis that living organisms cannot be separated from their species-specific environments, with which they form a whole in the physical sense. Ecological systems that come into being as a result of mutual interactions between individual organisms have been called by them as the ecosystems or ecological niches.

Before expounding the investigative attitude of ecologism with reference to Gregory Bateson's studies on the interactions between the mind of human organisms and their environments, it will be essential to assess earlier discoveries and achievements of some pioneers of biological sciences as proponents of theoretical distinctions and terms. At the beginning, one has to mention Arthur G. Tansley (1871-1955), an English botanist who has introduced the term *ecosystem* in the year 1935. The basis of Tansley's theoretical outline constitute four statements (cf. 1935, p. 299): firstly, that inorganic factors are part of ecosystems as fundamental functional units in nature, secondly, that without the inorganic constituents, the ecosystems could not exist, thirdly, that the constant exchange of various substances always occurs within ecosystems, not only between organisms, but also between the organic and inorganic components, and finally, that ecosystems of different kind and size are isolated by researchers from superior ecosystems only mentally for the needs of scientific research.

The next in turn to be mentioned is Joseph Grinnell (1877-1939) who used the notion of the ecological niche for the description of environmental properties of animals in his article "The Niche Relationships in the California" (1917). This term was defined ten years later by Charles S. Elton (1900–1991), in his book on *Animal Ecology*, as the place of an animal in its community/society, its relations to food and enemies, and also other factors (cf. Elton, 1927, p. 58). According to the conclusions made by Jorge Soberón (2007, pp. 1115-1123), both Grinnell and Elton argued that niches of the same kind could be inhabited by totally different species in different parts of the world.

In the last thirty years, interests of biologists in mutual relations between organisms and their environments mostly go hand in hand with their interests in the diversity of animals, to explain its environmental causes and significance for the survival of individual organisms, or transfer of genes from parent to offspring, etc. Behaviorally oriented ecologists, such as John R. Krebs and Nicholas B. Davis (1981), have proven that the behavior of animals, crucial for their survival and reproduction, is to a great extent determined naturally. In their opinion, it should be studied from the viewpoint of the economy of effort and decision-making in the face of costs born and profits made by the particular organism. Correspondingly, researchers studying animal behavior have to explain mechanisms of biological adaptation and rivalry, look for patterns of behavior focused on the acquisition of food, selection of partners, life in group, or describe differences between species, alternative ways of achieving the same aim by animals, etc.

Additionally, the notion of ecology is also used in a narrower sense, when it is associated with the concern for endangered species and the cleanliness of the environment, as well as the management of natural resources. Among many publications of this trend, for exam-

ple, *Ecology in the 20th Century: A History* (1989) by Anna Bramwell relates the development of the ecology movement, including environmentalism as ideology, the Green politics, etc., from the late nineteenth century over about one hundred years.

Furthermore, the ecological approach has been adopted to sociology by Robert Ezra Park (1864-1944) and Ernest Watson Burgess (1886-1966), representatives of the Chicago school. In keeping with the term *human ecology* formulated in their widely-read book *An Introduction to the Science of Sociology* (1921), it is rightful to say that human individuals, who act independently from one another while satisfying their needs and requirements, usually function in mutual relationships to realize their common aims, shared feelings, values and traditions. Therefore, they live in organized communities what allows them to exceed beyond biological conditionings and to transform their own world in which social forces, analogously to natural forces, determine their behavior.

Similarly, Amos Henry Hawley (1910-2009), an American sociologist of the next generation, focused on the behavior of societies from the viewpoint of their organization, development and changeability in time and space within the investigative framework of human ecology in the 1950s. As Hawley (1950) argued, the adaptation of humans to their biophysical environments results in expansion and evolution of groups and societies. Against the background of the notion of ecology in biology and the ecology of man in sociological perspective, the issues of the ecology of language are discussed by the author of this paper, Elzbieta Magdalena Wasik (cf. *inter alia*, 2010).

Gregory Bateson as a Social Scientist

Gregory Bateson (1904-1980), world-widely recognized as a social scientist, linguist, visual anthropologist, semiotician, and cyberneticist, was a son of the prominent English biologist and geneticist William Bateson (1861-1926). Being trained in anthropology and natural history, he published essays, delivered lectures, and took part in the majority of professional conferences during the last thirty-five years of his active life. His most influential works were published under the collective title *Steps to an Ecology of Mind* in 1972 (cf. Bateson, 1987 /1972/). As one could find out, *inter alia*, from the "Foreword by Mary Catherine Bateson, 1999" to the later edition of this book (cf. Bateson, M. C., 2000 /1972/, p. viii), their author conducted anthropological field work in New Guinea and Bali, collaborated with the psychiatrist Jurgen Ruesch, worked with mental patients in a Veterans Administration Hospital in Palo Alto, and took part in various debates concerning cybernetics as a new science. His work, however, integrated many investigative disciplines rather than belonged to any of them. In comparison with most scholars from cultural circles of his time, Bateson was able to see relations between man and nature in an utterly innovative way. As he could conclude, due to observations made in societies which he had investigated, it is the environmental sensitivity of man which shapes the human life. Bateson as a scholar who promulgated progressive ideas about science and cognition was also a superb teacher, lecturer, and story-teller.

Bateson's interests in relations between man and nature in which he took the perspective of natural sciences, not only the point of view of cultural anthropology, allowed him to elaborate original theories of learning and communication, to contribute to the development of cybernetics, system theory and information theory which were especially conspicuous in his ripper book *Mind and Nature: A Necessary Unity* (1979), summarizing all his earlier achievements.

It seems relevant to note that Bateson's pioneering conceptions pertaining to the study of organisms as open systems were present in publications of Ludwig von Bertalanffy (e.g., Bertalanffy, 1950 and 1968), whose theoretical and methodological distinctions inspired scholars since the mid-20th century. Aiming at explaining the mechanisms of (human) cognition, Bateson focused on the concept of cybernetic system. Central for Bateson's conceptual framework was the notion of pattern as a contextual structure which connects the items of learning and knowing (1979, pp. 7-17), the application of which is considered as one of his main merits for the formulation of the cybernetic theory of mind acquiring knowledge.

The Notion of the Ecology of Mind in the Works of Gregory Bateson

Bateson's understanding of knowledge results from the way in which he explains the nature of mind. For Bateson (1987 /1972/, p. 1), individual minds are aggregates of ideas which develop in the brains of cognizing organisms through the interaction with their environmental conditionings. Therefore, as he claims, they should be studied by the ecology of ideas, or the ecology of mind, related to epistemology as a theory of knowledge. In his article "The Cybernetics of 'Self': A Theory of Alcoholism", placed in the subsection on the epistemology of cybernetics, Bateson (1987 /1972/ [1971], p. 321) gives a report about investigative questions and disciplines involved in the study of the ecology of mind, as follows: "In the last twenty-five years extraordinary advances have been made in our knowledge of what sort of thing the environment is, what sort of thing an organism is, and, especially, what sort of thing a mind is. These advances have come out of cybernetics, systems theory, information theory, and related sciences.

As far as the notion of ecology itself is concerned, Bateson in one of the lectures on 'Form, Substance, and Difference' (1987 /1972/ [1970], p. 467), saw the need to distinguish its two faces, such as (1) economics of energy and materials (the so-called bioenergetics) and (2) economy of information defined in terms of thermodynamics as entropy and its reverse, which refer to the unordered states of being. He is known, however, for his conception of the ecology of general mind in the individual and collective sense which he defines as the ecology of the sets of ideas, or the ecology of the sets of notions and thoughts. He believes that the individual mind is contained not only in the body of a human individual. It is, in his opinion, which is, nevertheless, consistent with the view of panmentalism, immanent in circuits and messages outside the body, and, namely, within the larger mind, of which the individual mind constitutes only a subsystem. The following statement which Bateson devotes to Alfred Korzybski as the creator of general semantics, he reveals his view that compassion is not a human quality but a property of the world of nature in general, including its animate and even inanimate constituents:

The cybernetic epistemology which I have offered you would suggest a new approach. The individual mind is immanent but not only in the body. It is immanent also in pathways and messages outside the body; and there is a larger Mind of which the individual mind is only a sub-system. This larger Mind is comparable to God and is perhaps what some people mean by 'God,' but it is still immanent in the total interconnected social system and planetary ecology (Bateson, 1987, p. 468).

By way of explanation, Bateson's understanding of mind in general is similar to the conception of nature that is called as panmentalism, pansubjectivism, or panexperientialism, ad-

vocated by Alfred North Whitehead (1861-1947). In the belief of this English philosopher, discussed by Anderson Weekes (2010, 158-159), inanimate matter possesses supposedly a kind of inner life and hence also the ability to react sensitively to its environment, what is in fact unthinkable for the proponents of views on the separateness of mind and matter as not identical substances (cf. Whitehead, 1919 and 1929). To be precise, according to Weekes, supporters of Whitehead's philosophy mean here rather nonconscious subjectivity than universality of consciousness. At any rate, they are strongly convinced that unconscious feeling is a property of all organisms with a nervous system.

In biology, a partly parallel view was declared by Hans Driesch (1867-1941), being famous for his lectures collected and published as *Philosophie des Organischen* (1921). In keeping with Andreas Weber (2003, p. 18, 32, 77-78), Driesch's understanding of nature principally resembles the view proclaimed by Aristotle (384-322 B.C.) about the spiritual manifestation of life at different levels, from plants to man, resulting from its purposefulness, termed as the *entelechy*. As one can find out from Weber's interpretation of achievements in philosophy of nature, Driesch's lectures appeared to be inspiring for many of the holistic approaches to nature in contemporary German philosophy of biology. Worth mentioning is the fact that Driesch as an advocate of the animal psychology believed that, between the impacts of the outside world and the behavior of animals, spiritual processes take place, even though a teleological factor must here be present (cf. Weber, 2003, p. 77). More importantly, according to Driesch, a property of nature, which is the everything knowing reality, is, as summarized by Weber (2003, p. 88), its wisdom, because it understands itself single-handedly in its diversity. Anyway, going back to Bateson's ecological explanations of mind, they have far-reaching consequences for the assessment of the adequacy of human knowledge as well as the adaptive possibilities of man, and subsequently his relations to natural and social environments.

Preceptor-oriented Backgrounds of Bateson's Position to (Human) Knowledge

The view that the nervous system and languages that humans speak delimit their knowledge of the world was explicitly formulated by Alfred (Habdank Skarbek) Korzybski (1879-1950), an American scholar of Polish origin, who brought to life a novel discipline called general semantics as a theory of meaning formation in nature, language and culture. In his first major work *Manhood of Humanity* (1921), Korzybski explicitly argues that humans transmit knowledge and abstractions that are accumulated in cultures through time. Slightly later, in *Science and Sanity* (1994 /1933/), he has modified his standpoint maintaining that human beings are limited in what they know not only by (1) the structure of their nervous systems, but also by (2) the structure of their languages. It is evident that Korzybski's views undoubtedly have constituted inspiration sources for Bateson's reasoning, in at least three domains. Firstly, human beings cannot experience the world directly, but only through their abstractions, i.e., nonverbal impressions or gleanings derived from the nervous system, and verbal indicators expressed and derived from language; secondly, perceptions and languages sometimes actually mislead humans as to the facts with which they must deal; and, thirdly, for that reason, the human understanding of what is happening sometimes lacks similarity of structure with what is actually happening.

In order to weigh up the relevance of general semantics to the change of views on human nature, which took place, *inter alia*, in the theory and practice of interpersonal communication studies, it is worth to cite here particularly its interpreters, such as Samuel Bois and Joseph A. DeVito who worked in the same intellectual climate of opinion as Bateson. Both scholars have focused on the human individual without referring to such notions as mind, ecology and knowledge. In the chapter “The Place and the Scope of General Semantics” of his book with a characteristic title *The Art of Awareness*, Bois (1972 /1966/, pp. 12-42, cf. pp. 12-13) labels general semantics literally as “up-to-date epistemology” regarding it as a new science of “human knowing”, related to psychology, in other words, the science of mental activities of humans. Among such activities, which could be investigated in conjunction with the recent progress in sciences of man, he lists observing by senses, introspecting, thinking, doubting, attaining certainty, accepting the views of others, communicating their own views, differentiating facts from opinions, remembering and forgetting, solving problems, or inventing and creating. In summing up the main assumptions of general semantics, Bois (1972 /1966/, p. 10) formulates his opinion in a few concise statements. Firstly, mental activity of humans neither stands by itself, nor can be studied by itself; it is only one aspect of a certain whole, called by Korzybski as the semantic reaction, which must be, nevertheless, treated as the main unit of discourse. Secondly, there is no one way of thinking which would be common to all members of the human race; in consequence, semantic states vary from culture to culture and change within cultures in the course of time. Thirdly, the structured unconscious is built in human individuals through their culture as well as language, which is one of its constituents; hence, it is righteous to speak about the metaphysics of subject and predicate, substances and qualities, and ultimately, agent and action. And finally, contacts of human individuals with their inside and outside worlds are, as a matter of fact, the acts of abstraction that proceed at different levels; humans as interpersonal communicators can solve paradoxes and facilitate agreement only if they are aware of this fact. Researchers who deal with human cognition and communication do not dispense with the model of man as a semantic reactor, outlined by Korzybski and further elaborated by Bois. Corollaries drawn from the model and the description of semantic states provided by Bois imply, *inter alia*, that the human organism as a cognizing subject, always reacts, to its total environment as a whole, because its reactions, as one might state, including acts of cognition, are never exclusively intellectual, emotional or physiological (cf. Bois, 1972, pp. 18-25). A relevant discussion on the semantic reactor in terms of the structure and functions of the self may be found in DeVito’s *The Interpersonal Communication Book* (cf. DeVito, 1976, pp. 63-71).

For appreciating the referential value of the term *knowledge*, one has to ponder over the question what it means to *know* anything. According to Bateson’s observation described in his article “Style, Grace, and Information in Primitive Art” (1987 /1972/ [1971 {1973} /1967/, pp. 137-161]), that which an individual knows through the senses can become knowledge in his/her mind, even though the word “know” has in fact two principal meanings, such as (1) “to know through the senses, to recognize or perceive” and (2) “to know in the mind”. Moreover, knowing may also mean to “trust to ‘habit’”. As Bateson explains, knowledge is always connected with “a redundancy or patterning of a quite complex sort”; at the same time, some parts of the mind are redundant with the particular message about “knowing”. What is no less important, “there is a special form of ‘knowing’ which is usually regarded as adaptation rather than information” (the above quotations come from Bateson 1987, p. 143).

As a matter of fact, it is also Bateson's claim that the knowledge can be sometimes unconscious, or not fully realized. Speaking about the world of humans, Bateson (1987, p. 143) gives numerous examples from the world of animals. Thus, the genome of the shark, as he argues, surely does not contain direct information about hydrodynamics; the shark is, however, shaped for locomotion in water; its genome supposedly contains information or instructions which are the complement of hydrodynamics. Similarly, a migratory bird may contain the complementary instructions necessary to cause it to fly in the right direction. In nature, as it seems, the better an organism "knows" something, the less conscious it becomes of its knowledge. It is surely a surprising statement, expressed by Bateson (1987, p. 143), that relates, for example, to art and skill, namely, that it is as if knowledge, understood as "habit" of action, perception, or thought was sinking to deeper and deeper levels of the mind.

Separate attention, Bateson (1987, p. 148) devotes to the distinction made by Sigmund Freud (1856-1939), the founder of psychoanalysis, for whom mental operations of the unconscious are structured in terms of primary process, while thoughts of consciousness, especially those verbalized, are expressed in secondary process. Contrary to all appearances, humans, as he maintains, do not possess knowledge about the secondary processes at all. Following Bateson's line of reasoning, "primary-process thoughts and the communication of such thoughts to others" are, from the evolutionary point of view, "more archaic than the more conscious operations of language" (Bateson, 1987, p. 151). This fact has implications for the economics and dynamic structure of the individual mind. Hence, on the one hand, what a human individual knows best is that of which he or she is least conscious, and, on the other, the process of habit formation is equal to "a sinking of knowledge down to less conscious and more archaic levels" (Bateson, 1987, p. 151). At this point Bateson's further conclusions pertaining to conscious and unconscious cognitive processes are worth quoting:

The unconscious contains not only the painful matters which consciousness prefers to not inspect, but also many matters which are so familiar that we do not need to inspect them. Habit, therefore, is a major economy of conscious thought. An individual can do things without consciously thinking about them. The skill of an artist, or rather his demonstration of a skill, becomes a message about these parts of his unconsciousness (Bateson, 1987, p. 151).

Accordingly, Bateson arrives at a conclusion that there are such kinds of knowledge which can easily be sunk to unconscious levels because they continue to be true regardless of changes in the environment. However, other kinds of knowledge must be kept on the surface, in other words, in an accessible place, for the reason that knowledge which controls the behavior must be modified depending on situation and the requirements of the moment.

Dealing with the phylogenetic development of the species in "A Theory of Play and Fantasy", Bateson (1987/1972/ [1955/1954/], p. 184), notices that it might have been a vital stage in the evolution of humans when they started communicating by signals. The characteristically human invention of language could follow then, and subsequently also the expression of the complexity of mental states and contents, including empathy, identification, projection, etc., which was connected with the opportunity to communicate at many levels of abstraction. Thus, broadly understood cognitive processes take place at different levels of abstraction, and, at the same time, knowledge is communicated at different levels of abstraction, too. What is more, the relationship between theories of learning and genetics and evolutionary theory is analyzed in Bateson's lecture „Minimal Requirements for a Theory of Schizophrenia", Bateson (1987/1972/ [1960], p. 258).

In still another lecture “Problems in Cetacean and Other Mammalian Communication”, Bateson (1987 /1972/ [1966 /1963/], pp. 382-383), points out to the fact that human sense organs become transmitting organs for signals. As he adds, humans have many taboos, for example, on observing one another’s kinesics, especially as too much information can be got in that way. In this context, special emphasis deserve the premises of Bateson’s theoretical stance devised, for the purposes of the analysis of human and animal behavior, on the basis of his previous work in anthropology, ethology and psychiatry. He came, *inter alia*, to the conclusions that the layers of knowledge accumulated by organisms determine their individuality, or individual character. In detail, he assumed that (1) the relationship between organisms is a sequence of stimulus-response sequences, and in consequence, of contexts in which the so-called proto-learning occurs, (2) the deutero-learning (i.e., learning to learn) is equal to acquiring of information about the contingency patterns of the contexts in which proto-learning takes place, and (3) that the character of the organism is the aggregate of its deutero-learning and, as such, it reflects the contextual patterns of past proto-learning (cf. Bateson, 1987, p. 369).

However, in the lecture “The Logical Categories of Learning and Communication”, Bateson (1987 /1972/ [1968 /1964/ [1971]]) speaks in favor of discussing learning in communicational terms:

There is /.../ almost no formal theory dealing with analogue communication and, in particular, no equivalent of Information Theory or Logical Type Theory. This gap in formal knowledge is inconvenient when we leave the rarified world of logic and mathematics and come face to face with the phenomena of natural history. In the natural world, communication is rarely either purely digital or purely analogic. /.../ there is a continuous gradation from the ostensive through the iconic to the purely digital [communication]. At the digital end of this scale all the theorems of information theory have their full force, but at the ostensive and analogic end they are meaningless (Bateson, 1987, p. 296).

Paying attention to “The Role of Somatic Change in Evolution”, Bateson (1987 /1972/ [1963], p. 362) affirms the investigative correctness that the phenomena of somatic adjustment are best described according to their economics of flexibility, however, as he comments, the scientific knowledge of these matters, both in man and other organisms, is very slight. Generally taken, the belief that the presence of a stress may reduce the ability of the organism to respond to another stress is, in spite of all, widespread. As it is often observed, people adjusted to the office life may have difficulties in, for example, climbing mountains, while trained mountain climbers sometimes have difficulties when confined to offices; similarly, the stresses of retirement from business may be harmful and destructive, etc.

Finishing the survey of views on the ecology of mind and human knowledge advocated by Gregory Bateson, it would be appropriate to cite the meaningful quotation from his paper “Conscious Purpose versus Nature” (1987 /1972/ [1968 /1967/]), which summarizes the general idea of his holistic approach to consciousness, communication and cognition:

[W]e have the systemic nature of the individual human being, the systemic nature of the culture in which he lives, and the systemic nature of the biological, ecological system around him; and, on the other hand, the curious twist in the systemic nature of the individual man whereby consciousness is, almost of necessity, blinded to the systemic nature of the man himself. Purposive consciousness pulls out, from the total mind, sequences which do not have the loop structure which is characteristic of the whole systemic structure. If you follow the ‘common-sense’ dictates of consciousness you be-

come, effectively, greedy and unwise – again I use ‘wisdom’ as a word for recognition of and guidance by a knowledge of the total systemic creature.

Lack of systemic wisdom is always punished. We may say that the biological systems – the individual, the culture, and the ecology – are partly living sustainers of their component cells or organisms. But the systems are nonetheless punishing of any species unwise enough to quarrel with its ecology (Bateson 1987, p. 442).

It is evident that Bateson favors rather a systemic than a purposive approach to nature and culture of man. Hence, he questions the purposiveness of consciousness, in other words, the coupling between man and his environment through conscious purpose, to be a condition and/or proof of wisdom. This way, he supports the outlook that wisdom can be acknowledged a property of nature, and therefore, the species-specific approach to human cognition and knowledge must be definitively changed.

Conclusion

To summarize Gregory Bateson's investigative positions, it is suitable to point out that, premising on arguments coming from natural and social sciences, he has put forward the conception of the ecology of general mind which is the ecology of the sets of ideas, in other words, the ecology of notions and thoughts. Thereby, he has advocated some novel views on man, communication and cognition. Firstly, the appreciation of the biological unity of organism and environment has led him to specify the meaning of the notions of embodiment, contextuality, and pattern, and to recapitulate the conventional opinions on human mental abilities from the viewpoint of learning and knowing in the phylogenetic and cultural perspectives. Secondly, the distinction between the economics of energy and materials and the economy of information allowed him to question the importance of consciousness in cognitive and adaptive processes of organisms. Thirdly, the realization of the entropic aspects of ecological processes induced him to doubt whether the information transformed by consciousness is in actual fact always adequate and appropriate from the viewpoint of the adaptation of man to his environment, or whether the consciousness distorts the transformed view, and, to some extent, destroys the balance between the individual, society and a greater ecosystem.

Believing that the world and mind have a systemic nature, Bateson was interested in knowledge as the result of accumulating life experiences by individual minds through communicative interactions, and/or transactions, in which they engage with their surroundings. He demonstrated that ideas, or knowledge understood in this way, similarly to some constituents of biological ecosystems, constitute part of ecosystems in human societies that do not exist without them. Moreover, there is an exchange of ideas between ecosystems of different kind and size, including human ecosystems that are to be defined in terms of cultures, societies, social groups and other groups in which people communicate. According to Bateson, human individuals develop within their ecosystems because it is the environment, or the society, as a specific kind of niche, what contributes to the differentiation between individuals, and their ideas. However, it is not only the mind which ‘cognizes’ but the whole body. In this sense, epistemology, that is, for Bateson, cognition, is comprehensive, or holistic, which means that knowledge can be also unconscious, or not fully realized. What must be particularly stressed is that, even though mind is universal, common, or general, the knowledge is, according to Bateson,

only individual; hence, there is no intersubjective knowledge. Despite that, or just therefore, as Bateson argued, there is never certainty whether knowledge, or the information transformed by consciousness is commensurate with the state of affairs to which it refers, or right and proper from the viewpoint of the adaptation of the human individual to his or her environment. Since the consciousness can deform information and destroy the balance between the individual and his or her ecosystems, Bateson sees a necessity to replace the purposive way of thinking with the systemic way of thinking in terms of patterns and similarities.

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