SPHERICAL BOOK

SHARING IN ACTION: BOGDANOV, THE LIVING EXPERIENCE AND THE SYSTEMIC CONCEPT OF THE ENVIRONMENT

Giulia Rispoli

This paper discusses the novelty of Aleksandr Bogdanov's approach, which combines the systemic and cybernetic perspectives employed in his *Tektology*, the general science of organization (1913–1922). In this work Bogdanov places particular emphasis on the concept of the environment and situates the process of 'organization' in a shared social context. The interaction among social agents, and between them and their contextual surroundings, implies a cybernetic relationship. The environment is, in fact, regarded both in terms of its influence in shaping human living conditions and in its plasticity in being transformed by human labour for specific purposes. Likewise, in *Tektology*, Bogdanov considers not only the social context but also biological and ecological systems that foster an emergent relationship between organisms and their environments. On the one hand, the environment favours biological organisms most well adapted to its conditions; on the other hand, the environment is seen as a portion of space (ecosystem) in which populations live and continuously modify the biogeochemical conditions of that system. By referring to biological, ecological and cognitive levels of cybernetic organization, I argue that Bogdanov's *tektological* polymorphic idea of the environment embraces different dimensions of the systemic discourse, and can also be useful to understand the process of knowledge creation underlying the idea of a proletarian culture.

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One or more ways to represent the world

Contemporary interpretations of Bogdanov as a pioneer of cybernetics and systems theory see his contributions only as precursors to later perspectives. As James White and Vadim Sadovskiy pointed out, Bogdanov's early thinking, and in particular his epistemology, deeply influenced the rise of the *General science of organization* and his *Empiriomonism* should be considered the philosophical foundation of *Tektology* (White 1998; Sadovskiy 1992). By reversing the perspective that sees Bogdanov's empiriomonistic ideas as the theoretical ground for *Tektology*, I will use, instead, the biological and ecological concepts described in his later work on the universal science of organization to illuminate his earlier discourse about the production of knowledge in a social context.

During the constitution of the Russian Social Democratic Labour Party in 1898, new cultural ferments from Europe reached Saint Petersburg to influence the political ideas and activities of a rich group of intellectuals. These intellectuals were fascinated by the epistemological revolution that the physicist Ernst Mach and the philosopher Richard Avenarius carried out in Europe and decided to introduce these 'ambiguous' philosophical notions to the Bolsheviks. The followers of Avenarius and Mach thus ignited an ideological debate between revolutionaries. The split was much more than a simple political controversy – it had the power to shake the columns of the entire theoretical apparatus on which Russian Marxism had been founded (Tagliagambe & Rispoli 2016; Plaggenborg & Soboleva 2009; Strada 1994).

One of the most important interrogatives on which the Russian 'Machists' and the dialectical materialists diverged regarded the way we produce knowledge and the means by which we know and represent the external world[1].

In *Empiriomonism*, Bogdanov illustrated that his philosophical theory was opposed to Lenin's dialectical materialism and was inspired instead by Richard Avenarius' empiriocriticism and Ernst Mach's psychophysiology. Both theories were largely responsible for the rapid growth of empiricism that took place in the twentieth century. Avenarius and Mach claimed that knowledge should be limited to sensations and that the only accurate description of the natural world is that which is experienced by one or more of the five senses (Hirschheim 1992: 19). Sensation is seen by Mach as a biological adaptation of the

1 See the article of Daniela Steila (2016) published in this volume.

organism to the environment[2]. Man's sensations are in fact absolute and certain. But what can man know through his sensations? What does he primarily assume during the process of knowing? Can he assume the real existence of the external world?

Following Avenarius's argument, when a person has an experience, three things are immediately assumed by that person: the environment as a portion of space where other individuals live; other human beings expressing their verbal assumptions about the environment, and he finally assumes that what a person experiences somehow depends on the connection between these two kingdoms. Thus, during the process of knowledge creation, man assumes the existence of different individuals who communicate with each other, the environment constituted and organized by those individuals, and the dialectic process established among them (Avenarius 1972).

As in Jan C. Smuts's analysis, Life, Mind and Matter are elements that utterly co-exist and compound with each other (Smuts 1972; f.e. 1926), for Avenarius, the above conditions represent the original nucleus around which all the experiences, thoughts and speculations, regardless of their sophistication, gather. These three elements represent the alphabet of knowledge.

Experiencing the environment in Avenarius's empiriocriticism

In the book *Critique of Pure Experience* (*Kritik der Reinen Erfahrung*) (1888), Avenarius asks whether a so-called 'pure experience', which is an experience not characterized by any specific determination, can exist (Verdino 1972). Experience depends on what the individual concretely experiences — the external environment — and that knowledge is not independent of what is supposed to be grasped, which is again the environment and its components. Avenarius states that pure experience does not exist because it would be completely outside human capability and independent of human agency. Two issues are very important in Avenarius's empiriocriticism: the first is the interconnection between individuals and the environment, and the second is that knowledge exists only in the continuous communication of experiences among individuals in a shared environment (Avenarius 1972). As a result, the process of knowing is open and never fully accomplished; nobody can pretend to know the absolute truth. Knowledge fluctuates in the middle of a process that involves the person having the experience, the

2 Mach wrote this in his *Analysis of Sensations*, published in 1886, which laid the foundation of Empirism. Science, he said, can only attain certainty if it is built on sensations. See Hirschheim 1992: 19.

individuals and the environment. Only what is being communicated could be considered an experience. In other words, experience and communication of that experience overlap and the possibility of knowing implies a continuous process of interaction and exchange of assertions that are never held once and for all. On the contrary, they are constantly reinvested into new experiences and new verbal communications. In this view, the environment is not simply a physical space but is embodied in a process of information sharing among individuals. Therefore, according to Avenarius, all mental processes should be investigated using a reverse viewpoint: instead of primarily approaching mental functional relations from an internal, cognitive perspective, we need to focus on the inputs coming from the environment where the exchange among individuals occurs.

The process of knowledge creation is not a passive recording of external phenomena but an active behaviour aimed at understanding and grasping 'facts' of nature that belong to the group and are collectively learned. However, Avenarius seems to regard the process of communication prior to the process of 'adaptation' to the environment. In his view, the possibility of knowing implies a process of assimilation of the spatial and social environment through inter-communication of individual experiences. Likely, Avenarius contemplates mostly human knowledge in his theory because it was directly linked to his main interest in human psychology. Mach, on the other side, takes into account elementary biological organisms as well, showing how sensations do not belong only to humankind. A sensation, which is a product of biological evolution, is not just about individual sentient beings and their psycho-cognitive structures; rather, it is a global process that affects the whole body. It also occurs in less complex elementary organisms in which cognitive structures are almost absent. In such cases, Mach speaks about whole perceptual behaviours arrangements. A sensation, in Mach's view, is a relational mechanism and propagates itself along multiple sensory connections (Mach 1915).

In the next section, we shall investigate Bogdanov's interpretation of the relationship between organisms and the environment in the framework of modern evolutionary theories. Then, we shall consider the process of knowledge in Bogdanov's view and conclude with his idea of culture as living experience.

Organisms and the environment as a cybernetic system

In Bogdanov's view organisms, regardless of their biological complexity — whether ants or human beings — build their social and natural environments by modifying them, step by step, in ways that are beneficial to themselves. However, the environment, far from being

passive, is constituted by individual works as a set of circumstances that put a pressure on a community, and this reduces the spectrum of activities that a community can possibly undertake. The interdependency between organisms in nature and the constraints that nature imposes on economic life is important in Tektology. The relationship established between organisms and environments, or following Bogdanov, "among different organized complexes" (Gare 1994), is mutual and correlative instead of unidirectional and deterministic.

About twenty years after Bogdanov wrote *Tektology*, the idea of a holistic and anti-reductionist view of the relationship between organisms and the environment in Western evolutionary biology still represented a challenge. During the period of Neo-Darwinism, as the Modern Evolutionary Synthesis developed, the properties of the environment were drastically oversimplified for example in the understanding of natural selection, which was at times conceived as a mere mechanical factor (Rashevskiy 1960). This paradigm, which tried to reconcile Mendelian genetics with gradual biological evolution by means of natural selection acting on mutations, has been a dominant one within evolutionary biology since 1950. However, the definition of 'modern synthesis', a term that had already been coined by Julian Huxley as early as 1942, explained natural selection as a powerful causal agent of evolution and over time this became seen as its exclusive force (Gould 1984).

The paradigm shift did not take place until the 1970s when several biologists, Richard Lewontin among them, started to criticize the idea that the environment can be understood as being independent of the organisms themselves. According to Lewontin, in discussing the interaction between organisms and the environment, Neo-Darwinists had started from two definite and independent entities: the genome and the physical environment, describing the development of the organism as a result of both of them. But in doing so, they never considered that during this process, the environment is continually being redefined and reshaped by the developing organism (Lewontin, Rose, and Kamin 1984: 277). For example, Robert Brandon, who is largely known for his contribution to eco-evolutionary theories, shows that all organisms in a particular region of space and time share the 'external environment', but to understand the particular selective forces acting on one lineage of organisms, it is necessary to pick out a specific 'ecological environment', so that the ecological environment of a fly will be quite different from that of a tree, even if they occupy the same external environment (Griffiths 2014). Thus, we can investigate the environment at different layers according to the functional and physiological relations that occur between different organisms and environments in a specific niche. Even

if we study one single organism in the course of its development instead of many organisms, we should think in terms of multiple environments. As Bogdanov wrote in *Tektology*:

"Here is a germ of plant. As its cells reproduce, they turn to be in increasingly dissimilar environments: some go down into the soil, others rise into air; originally similar, they inevitably modify in terms of the increasing divergence. The principal point is that the dominant materials for assimilation are dissimilar: in soil, these are mainly water and salt; in air carbon dioxide, oxygen, and radiant solar energy. All the above materials, however, are part of the structures of all cells, i.e. assimilated and dissimilated by all parts of the system. In what direction then must the selection regulate the development? What correlations of the diverging parts will be most stable? Its parts complement one another, and this is quite possible precisely thanks to the preservation of their connection which is kept intact by the common internal medium, the motion and the exchange of the plant's sap" (Bogdanov 1988: 157–158).

Thus, the development of a plant proceeds in accordance with the environmental circumstances of that plant's components during its development. In *Tektology* Bogdanov emphasizes the role of the environment within the evolution of biological systems also from the point of view of developmental and embryological explanations.

As Milan Zeleny pointed out, Bogdanov's system cannot be separated from its environment because it does not simply exist or interact within its environment: "it is structurally coupled with it and thus evolves in its own environment while co-evolving with it" (Zeleny 1988: 333). This also explains why Bogdanov coined the use of 'complex' instead of 'system' that emphasizes a final state of natural things (Zeleny 1988: 333).

Bogdanov did not relegate the environment to the status of an element of disturbance to be kept under control. Similarly, this conception would frequently be reconsidered in further studies in cybernetics and systems theory: according to Wiener and Bertalanffy the environment is often mistakenly regarded as a perturbation that leads the system to a state far from equilibrium, whereas equilibrium is supposed to be the purpose to which a self-organized system should aim. Signals coming from the environment are put aside because they might create a deficiency in the organization of the system. The idea of the environment as an element of disturbance marks the General System Theory as inferior when compared to Tektology (Zeleny 1988).

According to Pushkin and Ursul (1994) there are two distinct levels by which we can interpret the attitude of systems, such as

organisms, toward their environment: self-regulation and the self-organization. Self-regulation is inherent to systems that maintain the *status quo*, which means a static state of equilibrium that can be formalized through a mathematical explanation. A self-organizing system, however, which Bogdanov describes as one that shifts from the static to the processual aspect of the objects, maintains a more complex relationship with the environment because it assimilates material that then creates the conditions for that material to emerge and evolve to a different stage, in a new configuration, which in turn modifies the surrounding environment through the release of different outputs. Thus, the latter it is a more dynamic process that involves the notion of *feedback*, which exists in those cases in which each part of the system affects the other, and each part acts in a different way according to the stimulus it receives[3]. The interconnectedness of all the elements of nature depends upon a continuous process of aggregation and disaggregation or conjugation and separation of systems. Not only does the environment control the system, the system also controls the environment; they establish a cybernetic interaction (Rispoli 2015).

Bogdanov insists emphatically upon the role of evolutionary relations in the dialectic between the inside and the outside, a distinction that sometimes is hard to state, especially when we take microorganisms, organisms like worms or even bio-geo-chemical processes such as photosynthesis as examples. "Only a very small fraction of the environment of an organism is inorganic. The largest part of that environment is formed by other organisms [...]" (Rashevskiy 1960: 246)[4]. Almost every organism depends for its existence on the presence of other organisms. A good example, and one which challenges the conventional Neo-Darwinian comprehension of the relationship between organisms and environments, is the phenomenon of symbiosis, a mutualistic association between two or more organisms. Bogdanov uses this example to elucidate the features of the process of complementary correlation. He shows that some cellular algae live in symbiosis with unicellular animals, and that they cyclically exchange chemical components and nutrients. The animal consumes oxygen and excretes carbon dioxide, while the plant decomposes carbon dioxide releasing oxygen which is immediately absorbed by the animal. Here,

3 Regarding Bogdanov's feedback as a "bi-regulative" process, see Peter Dudley (2016) in this volume.

7 As Bogdanov stated: "Living organism is characterized as a machine which not only regulates itself but also repairs itself. As the elements of tissues of organism wear off it replaces them with material taken from the environment and 'assimilated' […]. The dead matter taken from (outside) is transformed by the protoplasm into its living matter, chemically identical" (Bogdanov, Chapter V, sections 7: 95–99). This quotation has been taken from a collection of unpublished materials of Bogdanov's Tektology made available thanks to Peter Dudley.

the closest environment of an organism is substantially the other organism, and, at the external environment only at a different scale. In symbiosis, the relationship between organisms and the environment is akin to interpenetration because the boundaries are basically permeable, and the organisms are so closely associated that they form a new integrity[5].

According to Bogdanov, organized systems require a changing environment and a system under development involves an environment under development. The environment plays a constitutive and constructive role in the process of the structural evolution of those (Pushkin and Ursul 1994). Plasticity is therefore an important feature of tektological complexes, which can be analysed as evolving unities thanks to the continuous exchange of matter and energy with the environment.

Many years after Bogdanov's work, this idea is still found challenging. In the science of ecology, the interaction between the biological community and the environment tended to be viewed as unidirectional. It was assumed that the species evolved in the environment and "the reciprocal phenomenon, the reaction and evolution of the environment in response to species, was put aside" (Lewontin & Levins 1980: 49). A static complex, be it the system, or be it the environment, does not exist in nature so the development of the system and of the environment co-evolve. They are part of a single complex that is differentiated in its functions and organizations. The existence of this complex depends upon its organization in relation to all other external systems; it is therefore not fruitful to study them in isolation since in isolation they do not even exist. As Sadovskiy pointed out, "the complex is a bogdanovian version of the modern concept of the system, which, in addition, is not interpreted as a set of interrelated elements but as a process of their organization's change, dependent on the structural linkage of the complex and its environment" (Sadovskiy 1992: 7). According to Bogdanov, the fluctuation of a system attributable to the intrusion of variables from outside should not be interpreted exclusively as disruptions to harmonies but as factors that can bring new possibilities of existence by stimulating the emergence of new properties and, in this way, the establishment of new organized entities.

Having in mind Bogdanov's powerful contribution in the framework of contemporary systems theories as applied to the correlative and co-evolving relation between organisms and environment, we shall now come back to his monistic interpretation of knowledge.

[5] Not surprisingly, symbiogenesis, the evolutionary origin of new morphologies and physiologies by symbiosis, has been in the forefront of Russian concept of evolution since the last century. See Margulis and Fester 1991.

Bogdanov's monistic shift: culture as active experience

In proposing his empiriomonistic theory on the genesis of knowledge, Bogdanov starts from similar epistemological premises as Avenarius – namely asserting the existence of a dialectical relation among three elements: the environment, the individuals comprising the spatial environment and the inter-dependence between their verbal expressions and the external environment. However, Bogdanov distinguishes his theory from those formulated by empiriocritics in one aspect in particular. He argues that the process of knowledge production has to be seen in terms of shared activities in the context of collective work driven by common purposes, rather than as inter-verbal communication in a shared environment. A person's experience of the external environment primarily refers to another individual's action rather than to his verbal message. Before individuals communicate what they are experiencing, they must already have had the experience that would later be summarized and communicated. First of all, knowledge presupposes a concrete action in the world that can be seen as a practice of mastering the environment. Therefore, what is firstly exchanged, prior to any enunciation, is knowledge in the form of a technical skill (White 1998; Tagliagambe 2004). Moreover, according to Bogdanov, empiriocriticism is too passive and focused on individual sensations. Experiencing implies an active, socially structured, interaction with the environment. The active nature of experience is stressed over passive perception (Rowley 2016).

Regarding knowledge as a sociological rather than epistemological phenomenon, Bogdanov argued that an analysis of cooperation within individual groups provides the basis for the study of the development of knowledge (Gare 1994). Different activities in concert mean for Bogdanov nothing other than 'general organization', and this is a key issue in his *Tektology*. Bogdanov shows that knowledge is the result of the organization of nature by labour; in turn, the organization is the tool by which individuals interact to transform the environment to better fit their needs. Knowledge is the organization of experience that is transmitted from generations to generations. Thus, in Bogdanov's view, organization can be seen as a collective process of construction of the surrounding environment that is considered both a biological and a cultural medium. These two dimensions are not separable and communicate with each other. As Maja Soboleva pointed out, there is no contradiction between the terms 'nature' and 'culture' for Bogdanov (Soboleva 2016: 3). In this respect, organization, described in *Tektology* as the universal mechanism of nature, also underpins the evolution of human culture conceived as an all-

embracing, living and evolving experience. Every kind of knowledge, from science, to philosophy to art and literature, is the result of man's organization over the environment that has taken place during his whole history and stem from the very basic element of experience – action. Bogdanov had inherited the idea of action as a primary source for the origin of language and cognition by the German/French philosopher Ludwig Noiré (1829–1889) who argued that "action" is the first rudimentary form of people's interaction in the social context of labour. The principles that Bogdanov derived from Noiré are described in White's article (1998). For Bogdanov, there was neither contradiction between nature and culture, nor between knowledge and practice. The experience of learning is, in fact, embodied in the process of sharing technical skills, tools and practices in a social, material context. Bogdanov replaced "individual sensation with collective experience" and regarded knowledge as a collective task (Rowley 2016: 10).

Bogdanov tried to apply his empiriomonistic ideas within the proletarian, cultural and educational institution (Proletkult) that he contributed to establish in 1917 with the aim of forging a real proletarian culture destined to and produced by workers[6]. In that context, Bogdanov could experiment his vision of knowledge production in the form of collective experience and collaborative, experimental practice. As McKenzie Wark pointed out, for Bogdanov scientists, artists and philosophers were 'organizers of experience' and the proletariat was called to organize its own culture instead of relying on knowledge and labour produced by other classes (Wark 2015).

The Proletkult offered a way for workers to self-organize and self-govern their agenda both in sciences and humanities and became the center of a major intellectual activity that was rooted in a strong tektological approach. It made the development of a new creativity possible by building up a space for active cooperation toward the creation of a new culture. Ultimately, it was predicated on a new way of living and knowing that reveals its leader's theoretical ambitions to put the action before the Machian elements of experience and the organization of labor at the base of knowledge evolution.

Conclusion

I have argued that the complex and systemic idea of the environment that Bogdanov deploys in his works provides a framework for his scientific ideas and undertakings. It is a framework that eventually enables him to bring into focus organization as a universal process of nature.

6 On the history of the Proletkult see Mally (1990).

Bogdanov's polymorphic concept of the environment, which he considered neither empty physical space waiting to be shaped by evolving living organisms nor a collection of structural conditions that rigorously and uni-directionally determine the life of the community from all points of view, offers a compelling narrative to understand also his ideas of culture as organization.

What is interesting is that Bogdanov provides us with an ample array of possible interpretations of the role of the environment across different disciplines and levels of analysis. These analyses include biological and ecological as well as cognitive and social dimensions. As Nikolay Krementsov has pointed out, an examination of Bogdanov's work provides a unique window into the interplay of the revolution in life sciences in its institutional, intellectual and cultural dimensions (Krementsov 2011).

I have showed that his work exposes the shortcomings of a reductionist approach towards the relationship between individuals and the environment that had been the predominant model for the understanding of evolutionary biology during the first half of the twentieth century. Emphasizing the co-determinant dynamics of systems and environments, Bogdanov brings into focus the construction of niches by biological communities, the interaction of cells and microbial communities within organisms. Importantly, he introduced the notion of the internal environment (the *milieu intérieur*), which is currently defined as 'microbiome' in scientific literature on epigenetic studies of the interaction between the genome and collections of microorganisms that constitute its environment. The concept of the environment featuring in *Tektology* can also be used when it comes to explore the social context and the way man produce knowledge. In this respect, we have seen that knowledge and the construction of cognition starts from the exchange of information in a learning, material context. In this case, the environment is seen as a space of knowledge — the space of collectively organized experience. In effect, the interpretation of the environment as a space where knowledge is made and shared is pervasive both in Bogdanov's earliest works, such as *Empiriomonism* or *The Philosophy of Living Experience*[7], and in his latest ones such as *Tektology* (at least the II and the III volume) and *O proletarskoy Kul'ture*. It is applied in cases when Bogdanov examines ecological systems and argues that the determinant dynamics of systems and the environment call for an understanding of a single living system of divergence in which organisms and environments, nature and culture, pertain to different levels of organization but are parts of the same material world.

7 This work, written by Bogdanov between the 1910 and the 1911, was probably based on lectures he gave at the proletarian schools in Capri and Bologna. See Rowley 2016.

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