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GEORGE GORELIK

BOGDANOV'S TEKTOLOGY: ITS NATURE, DEVELOPMENT AND INFLUENCE

A. Bogdanov [pseudonym of Aleksandr Aleksandrovich Malinovskii (1873–1928)] was an important interpreter of the social upheavals and the outburst of scientific discoveries which mark the turn of the century. The developments in science and technology, political and social practice, which were initiated in Bogdanov's time have, of course, proceeded apace in our century. Where the social cataclysms and the rapid pace of scientific and technological discoveries will finally lead few would be so foolhardy as to predict. This uncertainty is all the more reason for us to study the revolutions taking place in science and society at the turn of the century, in order to gain clear sense of our present bearings. Bogdanov, as a key interpreter of these changes, can teach us much. His splendid edifice of thought, which has great intrinsic worth, should also command our historical attention. His greatest work, the 3 volume treatise *Tektology: The Universal Organizational Science* [20], represents a synthesis and epitome of this many-faceted yet unified thought. This is the work which undoubtedly has most to say to us.

There is no need to outline the basic concepts of tektology here, since they have adequately been covered elsewhere [32, 33]. The reader interested in and as yet unacquainted with Bogdanov's thought should consult *Essays in Tektology*[1] [19], Bogdanov's own condensation and revision of his monumental *Tektologia.*[2] I shall limit myself in this paper to a discussion of (1) the nature of tektology, (2) the growth and development of Bogdanov's tektological thought and (3) its impact, suppression and influence. My purpose here is to establish a place for tektology among the modern generalizing sciences and to encourage its study and further development.

THE NATURE OF TEKTOLOGY

Tektology starts with the basic assumption that all phenomena are governed by organizational laws. "All human activity", writes Bogdanov, "is ... organizing or disorganizing. This means that any human activity, whether it

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is technical, social, cognitive or artistic, can be considered as some material of organizational experience and be explored from the organizational point of view" [20, p. 90]. All phenomena and human activity, then, can profitably be studied from this point of view. Tektology calls for the study of "any system both from the point of view of the relationships among all of its parts and the relationship between it as a whole and its environment, i.e., all external systems" [18, pp. 300–301]. This formulation of the method of tektology is identical to the approach of modern systems theory.

The world for Bogdanov consists of interacting systems which differ from one another by the degree of their organization. Organization is defined as the property of a system that makes it greater than the sum of its constituent parts. The greater the difference between the system as a whole and the sum of its parts, the better organized it is. The disorganized whole is, conversely, one in which the whole is less than the sum of its individual parts.

Bogdanov is essentially a monist – the world is itself one unified system whose parts, in turn, can be viewed as systems in their own right. Individual systems exhibit their own special laws of organization: specialized sciences have been developed to identify and study these laws. But the same systems are themselves parts of more comprehensive systems, which in turn form the parts of even greater systems. The world consists, then, of a hierarchy of systems, the apex being of course the world-system. Since all systems are interrelated, and can be seen either as parts or wholes, depending on one's point of view, general laws can be postulated to describe the universal rather than the specific organization of any given system. The aim of tektology is to identify and study the general laws of organization of any given system.

Bogdanov identifies and defines the laws governing the creation, maintenance, and transformation of systems. "Ingression", the exchange of elements between interacting complexes, is the mechanism involved in the creation of systems. Established systems are "regulated" by various universal forms of selection. These forms also explain the stability of systems, their convergences and divergences, differentiation and integration, and their structural transformations.

Tektology is characterized, first and foremost, by its organizational point of view. Any scientific question can be posited and solved as a tektological problem, which is to say, a problem involving the internal organization of a system and its relationship to its environment. Tektology is, in Bogdanov's words, "capable of yielding new results and leading to new

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statements of the most diverse questions of cognition" [19, p. 53]. Old problems, posited within the framework of the specialized sciences, can now be restated and explained within a tektological framework, which is what Bogdanov does in his own original reconsideration of human experience and science. His studies of ideology [14], the origin of animism [7] and that of sleep [19, pp. 50–52] are examples of such restatements and explanations.

Bogdanov views ideologies as forms of social bonding which are determined by the modes of production and the productive relationships within a given society. But he does not, like Marx, consider an ideology merely as the "super-structure" of the productive relationships within a society. For Bogdanov, ideologies "also organize a certain content, are determined by it and adapted to it" [19, p. 49].

Animism, the primitive view that objects of nature as well as living beings are divided into soul and body, is explained as the result of the transfer of the authoritarian labour relations existing among masters and servants into the realm of abstract throught. The active, organizing and authoritarian element of production thus becomes transformed into the "soul", while the passive, submissive and executing element is the "body". This hypothesis allows Bogdanov to account for the historical fortunes of animism, to explain "why it did not exist. . . during the first phases of the life of mankind before the development of authoritarian cooperation, why it was intensified during some epochs of history, weakened in others, following the rise or decline of this or that social form, etc." [19, p. 49].

Bogdanov explains the origin of sleep in terms of the relationship between the organism and its changing environment. As a rule, organisms which are adapted to day conditions are more vulnerable at night, and vice versa. It is necessary then, "for the organism to have, as fully as possible, isolation from this undesirable, periodically appearing situation; obviously, also a periodic isolation. Such is the role of sleep." [19, p. 51]. This organizational confrontation of the "organism and its environment" permits Bogdanov to solve the problem concerning the origin of sleep in principle. He recognizes, however, that the study "of the mechanism of sleep still remains to be done, but the governing idea is there" [19, p. 52]. Bogdanov applies the tektological approach to many other problems, such as those in economics [6, 7], sociology [8, 9], social psychology [10], proletarian culture [22], proletarian science [16], gerontology and hematology [23], and even Einstein's theory of relativity [21].

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In Bogdanov's view, tektology differs from the special sciences by positing questions and modelling phenomena in the most general way. The most general approach to questions reduces them to their utmost simplicity, and thus facilitates their subsequent analysis, and helps in the discovery of the shortest and clearest path to their solution. Such a simplification is achieved by the identification and abstraction of the most essential features of the system and its surrounding environment. True, solutions obtained by this method are only general solutions, since they refer only to those variables and parameters of the problem which were initially taken into account. "But", Bogdanov writes,

> this does not lessen the enormous significance of general solutions. They have a directing and governing role. . . . The regularity which governs the general model serves as the starting point and the main path for the investigation of special problems. These problems are solved by introducing complicating, special conditions and features one by one until the available information is thus exhausted [23, p. 8].

Generalized solutions are important for still another reason. In some cases particular questions can only be solved when they are preliminarily converted into general forms. Thus, if someone wished to determine directly the distance between the Earth and the Sun and "constrained himself within these limits, he would have never come to anything; but the solution of a more general problem – how to find the distance from an object without approaching it – has immediately opened the door to the solution of the given particular problem and of an unlimited number of others" [19, p. 60].

From this also flows another important conclusion concerning the relationship of tektology to particular sciences: "it is *unifying and controlling* ... all of their generalizations and conclusions", writes Bogdanov, "are subject to its verification from the point of view of precision and completeness, inasmuch as relative narrowness of the specialized point of view may be reflected in both" [19, p. 60].

Bogdanov considers tektology to be a universal natural science which should not be confused with philosophy. Like philosophy, tektology seeks explanations which are universally valid. But unlike philosophy, tektology subjects its explanations and conclusions to constant empirical verification. This difference is fundamental.

Modern systems research has established that Bogdanov anticipated most of the central concepts of later generalizing sciences, most notably Ludwig

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von Bertalanffy's General Systems Theory (GST) and W. Ross Ashby's Cybernetics [27, 33, 40, 45, 47]. The obvious resemblance of tektology to these later sciences has led a number of scholars to view Bogdanov's work as a prototype or variant of general systems theory, or as a special kind of cybernetics. Such a view, however, is unwarranted for the simple reason that the tektology transcends both. While tektology contains and integrates ideas later developed and popularized by general systems theory and cybernetics, its universal scope and method make it something more than either of them taken separately or simply added together.

A unique place can be found for tektology by comparing and contrasting it to both Bertalanffy's GST and Ashby's cybernetics. First, tektology shares the same basic assumptions and goals with Bertalanffy's GST. Both assume that all systems are subject to universal laws, and both are convinced that the classification and formulation of these laws can help to serve and unify the special sciences. Bogdanov takes as his point of departure "the fact that structural relations can be generalized to the same degree of formal purity of schemes as the relations of magnitudes in mathematics; and on this basis organizational problems can be solved by methods which are analogous to those of mathematics" [24, vol. 3, p. 209]. Bertanlanffy also insists on the formal purity of his GST, and its clear and all-embracing methodology: "General Systems Theory is a logico-mathematical discipline, which is in itself purely formal, but is applicable to all sciences concerned with systems. Its position is similar to that, for example, of probability theory, which is itself a formal mathematical doctrine but which can be applied to very different fields" [3, p. 139]. Tektology and GST share not only the same basic assumptions and goals: a number of their central concepts are practically the same. The concepts of integration, differentiation, centralization are common to both. Bertalanffy's theory of open systems is quite similar to Bogdanov's theory of dynamic equilibrium. The physical principle of Le Chaterlier and the principle of the minimum action are generalized in both theories. These are examples of only the main correspondences between tektology and GST; many more could be cited.

A number of correspondences can also be found between tektology and Ashby's cybernetics. The notion of feedback, which is central to cybernetics, finds its counterpart in Bogdanov's concept of the bi-regulator, which he defines as "a system for which there is no need of an external regulator because the system regulates itself" [19, p. 164]. Both cybernetics and

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tektology are agreed on the crucial importance of selection processes, and understand and interpret in similar terms the notions of mechanism, constraint, variety and modelling. Finally, they see their respective sciences as opening the door to new possibilities and diverse applications. For Ashby, cybernetics provides the framework in which "all possible machines ... may be ordered, related and understood" [1, p. 2]. Bogdanov envisages a more universal application for tektology, since for him, "things which are most distant from each other in everyday experience can be united by tektological laws which embrace all *actual* and *possible* transformations of forms" [19, p. 122].

All of this is not to say that tektology is some kind of cybernetics or a General Systems Theory. Even though tektology has many points of correspondence with these generalizing sciences, it nevertheless displays many unique features. The main distinguishing feature is the fact that tektology has a more fully developed theory of organization than either general systems theory or cybernetics. No less noteworthy is the manner in which tektology combines and integrates the best ideas which would later be posited in those two sciences. Tektology, therefore, provides an affirmative answer to a raised and as yet unresolved question: Are general systems theory and cybernetics a unitary science? [43, 55]. Finally, tektology is unique in its focus on organization and method, and in its universal scope. It embraces, as Bogdanov says, "the subject matter of all the other sciences and of all human experience giving rise to these sciences, but only from the aspect of method; that is, it is interested only in the modes of organization of this subject matter" [19, p. iii]. The fact that tektology focuses on universal modes and laws of organization would alone account for its many resemblances to GST and cybernetics. These same ideas and principles were, of course, developed independently, an event not rare in the history of science. The consensus of tektology, GST and cybernetics, so far as their main ideas are concerned, can only lend support to all of them. Tektology, however, can still claim precedence, not only because it predates other generalizing sciences, but also because it is the most comprehensive and universal of them all.

What, then, is tektology? So far, we can see that it is a general theory of organization. But a much better description is the name Bogdanov gave to it himself – the universal organizational science. This is a title that Bogdanov must have chosen carefully and deliberately, since he was well

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aware of the organizational power of words. The objection might now arise that tektology, despite its universal scope, is only a theory and not a science. A true science, after all, must have a rigorous methodology and have its conclusions subject to continual empirical verification. Although Bogdanov did not live long enough to provide the empirical evidence which he knew was necessary to convert his theory into a science, he provided the necessary foundation for such a science. Bogdanov also knew that when the conclusions of tektology were put to the test they would be subject to modification and expansion. This he left to future generations of researchers. The following prophetic remark is typical of Bogdanov: "What I will not do, will be done by others. Science is not an individual but a collective matter and its realm is infinite" [20, p. 12].

THE DEVELOPMENT OF BOGDANOV'S THOUGHT

"Many years ago", Bogdanov wrote in 1927, "I began that search into general regularities of all kinds of organizational processes which became the central pursuit of my life" [23, p. 122]. That pursuit began with the publication of his first book, a treatise on economics [6, 7], and ended with what is apparently the still unpublished research of the last two years of his life. This research involved no less than "a systematic reconstruction from the organizational point of view of the foundations of biology, social sciences and psychology" [24, Vol. 3, p. 7]. Bogdanov's tireless quest for a general science of organization forced him at various times to become an economist, philosopher, political activist, a theoretical and experimental scientist and even a novelist. All of these diverse activities are, however, dominated and unified by Bogdanov's overruling organizational viewpoint. Bogdanov's activities and publications prior to his *magnum opus* can thus be viewed as the discovery and tentative working-out of the central ideas of tektology, and all his subsequent work as their further expansion and application. A discussion of the entire development and growth of tektology is obviously beyond the scope of this paper. A look, however, at some of the antecedents and main aspects of Bogdanov's thought before *Tektology* [13, Vol. 1] is in order here.

To begin with, Bogdanov regards the evolutionary schemes of Spencer and, more importantly, the Hegelian and Marxian dialectics as the major

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precursors of tektology. He believed, however, that these antecedents were too specialized and fell short of the universal overarching organizational viewpoint of tektology, or its formalization of both the practical and theoretical organizational methods of man and the elemental methods of nature. In tektology, all these methods "explain and illuminate one another; in the absence of such an integral approach the solution of the question of organization is impossible, because a part torn from the whole can neither be made the whole, nor understood apart from the whole" [20, p. 61].

Bogdanov's study of dialectics soon led him to Marx. But despite his high regard for Marx, Bogdanov "was far from idolatry. He subjected Marxian teaching to the same kind of examination as any other theory that he considered important, and where he found it wanting in exposition or substance he said so with the complete assurance of an independent thinker" [49, p. 118]. Bogdanov adopted what he considered to be the two most fundamental ideas of Marx; namely, that the task of philosophers is not only to interpret the world, but also to change it, and that social consciousness is determined by social existence. He felt that other ideas of Marx had to be updated and harmonized with contemporary science.

The epistemological and sociological views of Bogdanov which paved the way for tektology are most fully expressed in his *Empiriomonism* [11], and later reaffirmed in the *Philosophy of Living Experience* [17]. Empiriomonism takes as its point of departure the method of empiriocriticism developed by Avenarius and Mach. Bogdanov accepts Mach's theory that knowledge is a form of social adaptation aiming at the purest description of experience within the maximum economy of thought. He also accepts Mach's view that the elements of experience (colours, sensations of hardness, heat and cold, etc.), are identical for both the physical and psychical realms. But Mach's empirocriticism does not completely overcome the dualism of mind and matter, since it assumes different causes and laws for the psychical and physical. Bogdanov attempts to overcome this dualism by considering the psychical and the physical as different modes of organization of the same experience. The psychical thus becomes individually organized experience, and the physical socially organized experience; the former is subjective and the latter objective. For Bogdanov "the objective character of the physical world is due to its existence not only for me personally but for all; it has . . . the same significance for everybody as it has for me . . . on the other hand, the subjective element in experience is that which has no universality and

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has meaning only for one or more individuals" [11, Vol. 1, p. 25]. The physical world, in effect, represents experience that is socially or scientifically organized. But empiriomonism does not resolve the question of objectivity by majority vote. Bogdanov himself makes this quite clear when he writes:

> In the history of thought... objectivity was sometimes on the side of one man against the rest of mankind. For example, in Copernicus' time the objective astronomical reality existed only for him, while hundreds of millions of people were mistaken in this regard. ... Copernicus alone embraced the accumulated astronomical experience up to that time in its entirety and was able to organize it harmoniously with the methods which corresponded to the level achieved by the collective efforts of mankind; other people possessed only parts and fragments of this experience, so that it remained unorganized in all its fulness [17, p. 222].

Bogdanov regards empiriocriticism, as developed by Avenarius and Mach, as the highest expression of speculative philosophy. But precisely because empiriocriticism is speculative and unpractical, it is unsuitable as a guide to the transformation of society. For Bogdanov, as for Marx, philosophy must base its methods and conclusions on actual social and labour practices in order to transform society and help improve man's lot. To this end, Bogdanov bases his philosophical approach on the practices of labour and adopts a new mode of causality as the starting point for his epistemology.

Causation was understood by 19th-century science to be controlled by rigid and necessary laws. Every effect was thought to be predetermined by a specific cause: the cause A would, under the same conditions, always produce its corresponding effect B. Bogdanov revises this deterministic model of causality by introducing human labour as a new factor. Human forethought and technical skill now enter the picture and help control and guide the causation sequence. The effect B is no longer rigidly determined by its antecedent A, but is the result of human planning and labour. Moreover, the cause A is converted into the effect B in the same way that the energy of coal or flowing water is converted into the work of machines. In general terms, a cause produces an effect in the same way that one force used in production is changed into another. The forces of nature can thus be harnessed by man and, with the proper technology, be directed towards the solution of a particular problem. Man is able, therefore, to change the world by "systematic and planned ... *transformation of energy*" [17, p. 209].

For Bogdanov, the only reality we can know is that reflected in human

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experience. The purpose of language, art, science and ideology is to organize that experience by means of cognitive models which range from words and concepts to scientific theories, myths, religious symbols and artistic creations. But where do these models come from? Bogdanov maintains that "thought takes its forms, in the final analysis, from social practice" [17, p. 229], and cites numerous instances of this process from history. Economic competition, for example, served as a model for the principle of natural selection in biology, and the discussions of the pre-Socratic philosophers eventually led to the formalization of dialectic in philosophy. Bogdanov calls models derived in this way *socio-morphisms.*

Closely related to socio-morphisms, and growing directly out of them, is Bogdanov's method of general substitution. This method involves the replacement of one cognitive model by another. The substitution of signs and symbols for things has, of course, been present throughout human history, and ultimately originates from the earliest developments of thought and speech. Primitive man was able to organize his experience through language and myth, while modern man has additional recourse to scientific theory. The method involves the "replacement of complexes which are simple, definite and stable by complexes which are richer in content but less definite and less stable; in other words, the replacement of a lesser but better organized content by one which is richer but less well-organized" [17, pp. 234–235]. For example, we use substitution when we replace the visual phenomenon we know as the sun with its scientific description as a conglomeration of gases behaving in accordance with the laws of motion. The progressive substitution of one socio-morphism by another allows a better understanding, organization and employment of human experience.

Bogdanov's epistemology leads him to perceive the universe as an "infinite, continuous series of complexes whose elements are identical to those of experience, and whose forms are characterized by the most varied levels of organization, progressively ascending from the 'chaos of the elements' to the complexity and harmony of 'human experience'" [11, Vol. 3, p. xxxviii]. Bogdanov's epistemology is, therefore, universal in scope and based on a firm empirical foundation.

Some may consider empiriomonism as a mere fusing of Marxian and Machian views. We have already seen that Bogdanov is indebted to Marx basically for his general philosophical approach. From Mach Bogdanov only took "the concept concerning the neutrality of the elements of experience in

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relation to the 'physical' and the 'psychical'. . . . In everything else", writes Bogdanov, "there is nothing in common between me and Mach" [11, Vol. 3, p. XLI]. The view that Bogdanov held of himself has been confirmed in a recent study by Jensen. This study demonstrates that empiriomonism goes beyond Marx and Mach since it attempts "to end the division of knowledge into philosophy and science . . . and to bring knowledge back to unity" [37, p. 167]. For Bogdanov, this unity can ultimately be achieved within the framework of tektology.

THE IMPACT, SUPPRESSION AND INFLUENCE OF BOGDANOV'S THOUGHT

Although the ideas of tektology are quite acceptable today, they were not so to most of Bogdanov's contemporaries. Even the foremost exponents of the natural sciences did not feel any pressing need for organizational studies. It can be argued that one of the reasons why tektology did not catch on in Bogdanov's time was due to the lack of empirical evidence supporting his systemic view of the world. Such evidence is now amply available and partly explains the recent spread of systems ideas. But lack of experimental evidence did not, for example, prevent the spread of dialectical materialism and Marxian ideas. Other forces must have been working against Bogdanov. And one of the most formidable opponents of his thought was without a doubt V. I. Lenin.

Between 1904 and 1907, Bogdanov was with Lenin a co-founder of Bolshevism and an acknowledged leader of the Party. His views were highly esteemed and shared by a number of other prominent Bolsheviks, most notably Lunacharsky, Bazarov, and Gorky. But since Bogdanov and many of his followers were not doctrinaire Marxists, they posed a threat to the fundamental tenets of Marxism, on which Lenin was convinced the revolution must be based. Lenin was therefore compelled to launch in 1909 a fierce attack on Bogdanov in his only philosophical work, the now famous *Materialism and Empirio-Criticism* [39].

Lenin knew Bogdanov's philosophical position as early as 1904; this, however, did not prevent their close collaboration for a number of years. But in 1908 Lenin found it necessary to determine "just what Marxism was so that one could distinguish Marxists from non-Marxists and force the latter either to change their opinions or to leave the party or at least the Bolshevik

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wing of it" [5, p. 240]. In *Materialism and Empirio-Criticism*, Lenin presented what he regarded as the correct interpretation of the philosophical views of Marx and Engels. He upheld their principle that all reality exists as a thing-in-itself and is subject to eternally valid laws. J. T. Blackmore, a commentator on Mach, traces the antecedents of these laws:

> Most of those laws came from science but some of them were selected from the philosopher Hegel. The most important Hegelian carryover was the notion that all reality contained 'internal contradictions' which were resolved through a 'dialectical process' in history. Everything in nature was determined, and there was an inevitable course in history [5, p. 242].

The internal contradictions existing within the social sphere, therefore, could only be resolved by the *struggle among classes*, which would inevitably lead to the dictatorship of the proletariat and, eventually, to the classless society of pure Communism. The establishment of the dictatorship of proletariat would, however, require a revolution, which was precisely what Lenin wanted in Russia. Thus Marx and Engels provided the perfect ideological support that Lenin needed for his Bolshevik revolution.

Bogdanov, however, completely rejected the notion of a "thing-in-itself", since he regarded it as a useless multiplication of entities which "attempts to explain the known by the unknown, what is accessible by what is *unexperienced* and *inexperienceable*" [26, p. 403]. Bogdanov's epistemology also led him to deny the objectivity of space, time, causality and absolute truths. Truth for Bogdanov is nothing more than an instrument for organizing human experience, and is valid only within the limits of a particular society and era. More importantly, the theory of dynamic equilibrium which he proposed as early as 1899 [8] caused him to adopt an entirely different dialectic from that of Marx and Engels. In Bogdanov's dialectic, a system's assimilation and disassimilation of energy create contradictions between the system and its environment. These contradictions disturb the relative equilibrium of the system, and disappear only when a new equilibrium is achieved. The new equilibrium, however, *need not always* be the result of "the struggle of opposites", as maintained by Marx, Engels and Lenin. Such an equilibrium can often be attained in social organizations through the co-operation of its members. In accordance with his epistemology, Bogdanov also firmly believed that the existence of social classes is due not to the distribution of ownership rights but arises because of the organizational experience gained by certain individuals. As a result, the ruling class in a social system is composed of the

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organizers of production and not the owners of the means of production. The elimination of class distinction, therefore, cannot be achieved through violent revolutions and the abolition of private ownership rights, but rather through the education of the members of society in organizational skills. Bogdanov was obviously at odds with Lenin on how the revolution was to be effected.

Lenin, of course, finally emerged as the supreme leader of the Bolshevik Party. Bogdanov, who would not budge from his philosophical position, was voted out of the Bolshevik Centre in the Summer of 1909. Less than a year later he left the Party never to return again. But before opting out, Bogdanov answered Lenin's criticisms and noted that Lenin's absolutism and authoritarianism were his greatest weakness [12]. But Bogdanov turned out to be quite wrong here, since these traits in fact helped Lenin to mastermind and execute a successful revolution. It is thus apparent that Bogdanov's thought had a completely negative effect on Lenin. It is little wonder, then, that Bogdanov's tektological works were attacked and later ignored when Lenin's *Materialism and Empirio-Criticism* became the keystone of Marxism–Leninism and Soviet science. Later Soviet critics have been unanimous in their condemnation of Bogdanov. According to one such critic, Bogdanov's thought was extremely dangerous and had to be suppressed "because he stood head and shoulders above all the other revisionists and attempted to introduce systematically his revisionist views in philosophy, political economy and sociology" [30, p. 27].

After his withdrawal from the Party, Bogdanov did not remain inactive in the social realm. During World War I, he served in the Russian army as a medical doctor. And in 1918, even though he took no part in the October Revolution, he emerged as one of the founders of the proletarian culture movement (*Proletkul't*) and an organizer of the first "Proletarian University". His tektological thought, in fact, inspired the ideologists and educators of the proletariat. Bogdanov's involvement in *Proletkul't*, however, was short-lived. It ended in 1921 when Lenin, concerned about Bogdanov's growing influence, had him removed from the movement. In the short preface (dated September 2, 1920) to the second edition of *Materialism and Empirio-Criticism Lenin writes:*

As for Bogdanov's latest works which I have had no opportunity to examine, the appended article by V. I. Nevsky gives the necessary information. Comrade Nevsky, working not only as a propagandist, but as a worker in a party school, had ample oppor-

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tunity to convince himself that under the guise of "proletarian culture" Bogdanov is introducing bourgeois and reactionary views [39, p. 3].

Nevsky's [44] article was a vituperative attack on Bogdanov and his tektology.

After finally being ousted from the *Proletkul't* movement, Bogdanov devoted the rest of his life to the elaboration of his tektological ideas and to experimental research in gerontology and hematology. In 1926 he organized and directed the world's first institute for blood transfusion which now, ironically, is called *Lenin's Central Institute for Hematology and Blood Transfusion*. One of his last books, *The Struggle for Viability* [23], was specifically written as a program for the Institute's research. It is only recently, however, that Bogdanov's contributions to Soviet medicine have been acknowledged [28].

During Stalin's reign of terror, Bogdanov's followers were officially condemned as "wreckers" and were subject to severe penalties. No one dared openly to style himself a "Bogdanovite", since that title would immediately brand him as a counterrevolutionary [50].

Despite the official condemnation of Bogdanov's thought, his tektological ideas continued to exert a positive influence on leading Soviet intellectuals, such as, to name a few, Bukharin, Gorky, Lunacharsky, Pokrovsky, Skvorcov-Stepanov and Timirjazev. Platonov, the noted Soviet author of the 1920s and 1930s, was also a devoted follower of Bogdanov [48]. Since tektological laws are scientific in nature, a number of Bogdanov's ideas on science, economic planning, and ideology have also been quietly absorbed by orthodox Marxists without, of course, any acknowledgement of the source.

Since the de-Stalinization of the late 1950s, the political and intellectual climates in the Soviet Union have considerably improved. The growth and success of cybernetics and the wide-ranging applications of general systems theory in the West have convinced Soviet scientists and philosophers of the importance and usefulness of a synthesis of the principles and methods of different disciplines. Even though leading Soviet scholars now regard Bogdanov as a pioneer of general systems theory and cybernetics, his tektological works are still not generally available. Setrov's [45] pleas for a reissue of, at least, Bogdanov's *Essays in the Universal Organizational Science* [18] with "a substantial critical preface", have so far been ignored. It appears that the Soviet authorities still continue to regard Bogdanov's thought as a dangerous,

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infectious disease, a challenge to Marxism–Leninism, requiring an indefinite quarantine.

It is difficult to assess what influence Bogdanov's thought has had in the West. Some influence, however, cannot be ruled out, since it is well known that Bogdanov was in his own time no stranger abroad. German translations of his *Science of Social Consciousness* [15] and the crucial first two volumes of *Tektologia* [25], and an English translation of *A Short Course of Economic Science* [7] have been available since the 1920s. A number of Western scholars have also displayed a keen interest in Bogdanov's relationship with Lenin [2, 29, 34, 55], his social and political activities [46, 54], his philosophy [34, 37, 49, 53] and sociology [35, 51]. This interest in Bogdanov's thought is rapidly growing today [38]. Unfortunately, Western scholarship has generally concentrated on Bogdanov the political activist and has more or less neglected Bogdanov the scientist. With some notable exceptions [35, 37, 51], tektology has either been ignored completely or just mentioned in passing by commentators. This one-sided view of Bogdanov has led to inaccurate and conflicting conclusions about both him and his work. But once the central importance of tektology for Bogdanov is understood, all such inaccuracies and false conclusions immediately disappear and the underlying unity of his life and work reveals itself.

In view of all this interest in Bogdanov, it is odd that studies of tektology have only recently appeared in the literature devoted to systems and organizational research [31, 32]. "The inexplicable neglect", write the Editors of HSM, "of *tektology* by general systems researchers of the past and present is likely to haunt General Systems history for many years to come" [36, p. 286]. But with the growing interest in Bogdanov's thought tektology is finally being given its long overdue recognition [33, 41, 42, 56, 57]. This recognition is well-deserved as the Editors of HSM would agree when they present their just evaluation of Bogdanov:

> A. A. Bogdanov has done nothing less than create a beautiful and powerful paradigm of *general science of organization* . . . Tektology is not only modern in its conception, it is dynamic and non-mechanistic, it does not assume away human beings, and it introduces theories of feedback, catastrophes, equilibrium-disequilibrium interaction, and autopoiesis at its very core [36, p. 286].

Tektology is relevant today both because it has much in common with modern generalizing sciences and because of its uniqueness as a general theory of organization. Ludwig von Bertalanffy recognized the need for such a

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theory when he wrote that "a basic problem posed to modern science is a general theory of organization" [4, p. 34]. This need stems from the fundamental problem of today, the problem of organized complexity where the nature of systemic elements, linkages, order relationships and dynamics of interaction is of paramount importance [52]. Despite the perceived necessity for a general theory of organization, contemporary research has failed to come up with such a theory. The study and further development of the newly "rediscovered" tektology is likely, therefore, to be fruitful.

NOTES

[1] This is the first English translation of Bogdanov's *Očerki Vseobščei Organizatsionnoi Nauki* [18]. For a brief review of the *Essays*, see *Human Systems Management* 2 (1981), 235.

[2] The word 'tektologia' originates from the Greek root 'ag' which also gave rise to numerous other words such as 'tekton' (builder), 'taksis' (order), 'tekhne' (trade, art), 'teknon' (child), etc. Within the greatest heterogeneity of these notions, all of them contain the general idea of an organizational process. For this reason, Bogdanov named his system 'tektologia'. Haeckel used this word before Bogdanov, but only in relation to the laws of organization of living beings.

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