



## Alexander Bogdanov

Russia, Physician, Philosopher and Organisational Theorist, 1873–1928

Alexander Alexandrovich Bogdanov was a Russian physician, philosopher, economist, political activist, writer and scientific researcher. Trained in medicine, he became active in the Russian revolutionary movement and was initially associated with the Bolsheviks, before developing substantial philosophical and political differences with Lenin. His major contribution to systems thought was Tektology, conceived as a universal science of organisation. He sought organisational principles applicable across physical, biological, psychological and social phenomena rather than separate organisational theories for each domain. Developed from the 1910s onwards, Tektology anticipated several concerns later associated with General Systems Theory, including interaction, organisation and disorganisation, boundaries, dynamic persistence, selection, differentiation and integration. Bogdanov later concentrated increasingly on science, culture, organisation and medicine. He also undertook pioneering work on blood transfusion and founded an institute devoted to transfusion research. He died in 1928 following a blood-transfusion experiment in which he participated personally.

Bogdanov, A. A. (1913–1922). Tektology: Universal organizational science. Parts I–III. [Russian editions, published and revised over several years.]

Bogdanov, A. A. (1980). Essays in Tektology: The general science of organization (G. Gorelik, Trans.). Intersystems Publications.

Bogdanov, A. A. (1996). Bogdanov's Tektology: Book 1 (P. Dudley, Trans.). Centre for Systems Studies, University of Hull.

### Notes

**DG** = General Systems Definition; **PG** = General Systems Proposition; **DS** = Special Systems Definition; **PS** = Special Systems Proposition. Each item is identified by the researcher's surname followed by its category and number (e.g. **Bogdanov DG.1**). (*Explicit*) indicates that the definition or proposition is directly stated in the researcher's work. (*Reconstructed*) indicates that it has been reconstructed from the researcher's work but is not explicitly stated in that form.



### Definitions Relevant to General Systems Theory

#### Bogdanov DG.1

**Complex** (*Explicit*): A plurality of elements, activities or processes considered in combination.

*Common idiom: An assembly or system of related elements.*

*Explanation: Bogdanov applies the term broadly across physical, biological, psychological and social organisation.*

#### Bogdanov DG.2

**Activities–resistances** (*Explicit*): Relational descriptions of interacting influences: what is activity from one perspective may constitute resistance from another.

*Common idiom: Interacting causal influences.*

*Explanation: Bogdanov avoids an absolute division into active and passive phenomena; the description depends upon the relationship considered.*

#### Bogdanov DG.3

**Organised complex** (*Explicit*): A complex in which combination increases the practical effectiveness of its components compared with their independent operation.

*Common idiom: An organised assembly whose relationships increase the practical effectiveness of its components.*

*Explanation: The qualification practical is important: Bogdanov is not claiming literally that a whole is quantitatively greater than the sum of its parts.*

#### Bogdanov DG.4

**Disorganised complex** (*Explicit*): A complex in which interactions among components reduce their combined practical effectiveness compared with their independent operation.

*Common idiom: An assembly containing mutually interfering processes.*

*Explanation: This is the converse of an organised complex and provides a systems-relevant account of organisation that can support or undermine performance.*

#### Bogdanov DG.5

**Conjugation** (*Explicit*): Interaction between complexes in which they undergo mutual organisational transformation.

*Common idiom: Interaction and combination producing organisational change.*

*Explanation: The resulting organisation may contain transformed versions of the participating complexes rather than their simple aggregation.*

#### Bogdanov DG.6

**Ingression** (*Explicit*): Connection of complexes through the formation or insertion of intermediate links that bring previously unconnected activities into organisational relationship.

*Common idiom: Mediated organisational connection through intermediate links.*

*Explanation: Ingression creates connectivity between complexes through intervening organisation; Bogdanov extends this towards wider chains of organisational connection.*



#### Bogdanov DG.7

**Disingression** (*Explicit*): The neutralisation or inhibition of opposing activities, which can interrupt interaction and, when complete, separate previously connected complexes.  
*Common idiom: Neutralisation or interruption of organisational interaction.*  
*Explanation: In Bogdanov's account, disingression is important to both boundary formation and organisational separation.*

#### Bogdanov DG.8

**Tektological boundary** (*Explicit*): A dynamically maintained separation arising where opposing activities are sufficiently neutralised between complexes.  
*Common idiom: A dynamically maintained constraint upon interaction between organised entities.*  
*Explanation: A boundary is organisational rather than merely geometrical. Its formation can divide organisation; its breach can permit renewed conjugation.*

#### Bogdanov DG.9

**Selection** (*Explicit*): A general process through which organisational forms are differentially preserved or destroyed according to an object of selection, an acting factor and a basis of selection.  
*Common idiom: Differential persistence or elimination of organisational forms under interaction.*  
*Explanation: Bogdanov's selection is broader than biological natural selection and is intended as a general organisational principle.*

#### Bogdanov DG.10

**Dynamic equilibrium** (*Explicit*): Persistence of a relatively stable organisational form through continuing changes whose effects approximately counterbalance one another.  
*Common idiom: Persistence through continuing compensating processes.*  
*Explanation: Stability therefore need not imply absence of change.*

#### Bogdanov DG.11

**Systemic divergence** (*Explicit*): Progressive differentiation of components exposed to different relationships and environmental influences.  
*Common idiom: Differentiation produced through differing interaction histories.*  
*Explanation: Bogdanov treats differentiation as an organisational process that can lead to both complementary and contradictory relationships.*

#### Bogdanov DG.12

**Crisis** (*Explicit*): A transition in which organisational connections or boundaries are formed or destroyed, producing change from one organisational form to another.  
*Common idiom: Transition between organisational configurations.*  
*Explanation: For Bogdanov, crisis does not necessarily mean catastrophe; it denotes organisational restructuring.*



### Propositions Relevant to General Systems Theory

#### Bogdanov PG.1

**Universal organisation (Explicit):** Organisational regularities recur across physical, biological, psychological and social phenomena and can therefore be investigated through a common science of organisation.

*Common idiom: Recurring organisational patterns can be compared across fundamentally different kinds of systems.*

#### Bogdanov PG.2

**Organisation and practical effect (Explicit):** Combination may increase, reduce or leave approximately unchanged the practical effectiveness of participating components, producing organised, disorganised or neutral complexes.

*Common idiom: Relationships among components can enhance, impair or leave unchanged the capability of an assembly.*

#### Bogdanov PG.3

**Conjugation and transformation (Explicit):** Interaction between complexes can transform the participating complexes and produce a new organisational system.

*Common idiom: Causal interaction can change participating entities and generate new organisation.*

#### Bogdanov PG.4

**Boundary formation and breach (Reconstructed):** Organisational boundaries can arise through neutralisation of opposing activities; breaching them can permit new interaction, while forming them can separate previously connected organisation.

*Common idiom: Changes in constraints on interaction can connect or separate organised entities.*

#### Bogdanov PG.5

**Dynamic persistence (Explicit):** Persistent organisational form can be maintained through continuing change where opposing or compensating processes approximately balance.

*Common idiom: A system can remain relatively stable while its sustaining processes continue to change.*

#### Bogdanov PG.6

**Environmental selection (Reconstructed):** Interaction with environmental conditions differentially preserves or destroys organisational forms according to their characteristics and organisation.

*Common idiom: Environmental interaction can differentially favour the persistence of some organisations over others.*



#### Bogdanov PG.7

**Law of the least relative resistances** (*Explicit*): The stability of an organisational whole under a particular environmental influence depends upon the part possessing the least relative resistance to that influence.

*Common idiom: System vulnerability depends upon the component or relationship least able to withstand the particular influence acting upon it.*

*Explanation: This is more precise than a generic 'weakest link' rule because weakness is relative to the specific disturbance.*

#### Bogdanov PG.8

**Organisation determines stability** (*Explicit*): System stability depends not only upon the quantity of activities–resistances available but also upon their structural organisation and relationships.

*Common idiom: Resilience depends upon configuration as well as the quantity of available causal capability.*

#### Bogdanov PG.9

**Systemic divergence** (*Explicit*): Complexes or parts exposed to different interactions and environmental circumstances tend to differentiate as their histories diverge.

*Common idiom: Different interaction histories can progressively differentiate components of an organisation.*

#### Bogdanov PG.10

**Complementarity through differentiation** (*Explicit*): Differentiation can generate complementary relationships among specialised parts or processes and thereby increase the capability or stability of the encompassing organisation.

*Common idiom: Differentiation can create mutually supportive specialised processes within a larger system.*

#### Bogdanov PG.11

**Systemic contradiction** (*Explicit*): Systemic divergence can also be associated with contradictions among differentiated parts whose interactions eventually reduce organisational stability.

*Common idiom: Differentiated processes can develop interactions that undermine the persistence or viability of the larger organisation.*

*Explanation: Bogdanov identifies the phenomenon; the underlying causal mechanism requires separate analysis.*

#### Bogdanov PG.12

**Contra-differentiation** (*Explicit*): Interaction among differentiated complexes can reduce divergence, reorganise relationships and potentially resolve systemic contradictions.

*Common idiom: Interaction can reduce differentiation or produce renewed integration.*



**Bogdanov PG.13**

**Crisis and organisational transformation** (*Explicit*): Creation or destruction of organisational connections and boundaries produces transitions between organisational forms.

*Common idiom: Changes in organisational connections and constraints can move a system into a different configuration.*

**Bogdanov PG.14**

**Conditional limiting equilibrium** (*Explicit*): The organisational form towards which a transforming system tends depends upon prevailing conditions, so similar components can produce different relatively stable organisations under different conditions.

*Common idiom: Relatively persistent states or configurations depend upon the conditions acting on the system.*

**Definitions Relevant to Special Systems Theories**

**Bogdanov DS.1**

**Egression** (*Explicit*): An organisational form in which activities are coordinated through a determining central complex and subordinate complexes.

*Common idiom: Centralised or hierarchical organisation.*

*Explanation: This is a Special Systems definition because centralised coordination characterises only some organised systems.*

**Bogdanov DS.2**

**Chain egression** (*Explicit*): An egressive organisation in which successive organising centres form a chain across multiple organisational levels.

*Common idiom: Multi-level hierarchical organisation.*

*Explanation: The concept applies specifically to systems organised through nested or successive centres of coordination.*

**Bogdanov DS.3**

**Degression** (*Explicit*): An organisational form in which relatively stable or less plastic structures constrain, protect or support more plastic organisation.

*Common idiom: Structural stabilisation through relatively fixed organisation.*

*Explanation: Bogdanov's examples include skeletons, shells, clothing, containers and relatively fixed symbolic structures; the mechanism is therefore not assumed to characterise all systems.*

**Propositions Relevant to Special Systems Theories**

**Bogdanov PS.1**

**Egressive coordination** (*Reconstructed*): Where organisation is egressive, a determining centre can coordinate the activities of subordinate complexes.

*Common idiom: In centralised systems, coordination can be concentrated in a component or level that constrains or directs subordinate activity.*



#### Bogdanov PS.2

**Hierarchical extension** (*Reconstructed*): Successive centres of egression can extend coordination through chains spanning several organisational levels.

*Common idiom: Hierarchical systems can propagate coordination through multiple nested or successive levels.*

#### Bogdanov PS.3

**Degressive stabilisation** (*Reconstructed*): Relatively fixed structures can stabilise more plastic organisation by constraining, protecting or supporting it.

*Common idiom: Some systems gain stability from comparatively persistent structures that constrain more variable processes.*

#### Student Exercise

1. **Understanding:** In your own words, describe one of this researcher's principal contributions to systems science.
2. **Generalisation:** Select one General Systems proposition. Give an example of it operating in a different kind of system from those studied by this researcher.
3. **GST or Special Systems Theory?** Select one item classified as a Special Systems Definition or Proposition. Explain why it should not necessarily be generalised to all systems.
4. **Critical evaluation:** Select one proposition and identify evidence or an example that would support it, challenge it, or indicate limits to its applicability.
5. **Translation:** Choose one of this researcher's original concepts and compare it with its common-idiom translation. What information, if any, is gained or lost in the translation?