

Center for Systems Research ¹
Working Papers ²

System and Significance

Overview

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I. GENERAL INTRODUCTION

The aim of **System and Significance** is to overcome the split between the naturalist and humanist approaches to the study of man and society. It codifies new ontological, epistemological, formal, and conceptual foundations; develops a postmodern general system theory; outlines a comprehensive pluralistic theory of bio-(psycho)-social systems; presents a unified theory of action; and formulates a new approach to communication and control in living and artificial systems.

This effort draws on both old and recent traditions of primarily European metaphysics, sciences, and humanities. It seeks to transcend the conflict that still simmers since its height at the turn of the Century about which methods are appropriate to human studies. It resumes the quest for a United Science dormant since the Fifties. It attempts to complete the project formulated by Talcott Parsons for a General Theory of Action and a Theory of Social Systems.

The new formulation of the Foundations of General Systems Theory is applied to phenomena usually regarded as subjective and therefore only amenable to phenomenological and hermeneutic approaches. While drawing on the history and on current formulations in the sciences, it addresses the central issues of the humanistic interpretation of human existence: being in (including standing out of, or being estranged from) the body, being in the world, being in the mind, being in society, being in culture, being in time, being in history, being in control, and being in communication with oneself and others.

Since the work is synthetic, it is relevant to a wide range of readers, particularly those interested in overcoming the rapidly increasing fragmentation of intellectual life. It introduces ideas from philosophy, physics, and systems theory to biologists, psychologists, and social scientists, whose knowledge of these areas is normally meager, partial, or antiquated. For specialists in all these fields, it offers a systematic and unified conception of the whole domain of bio-(psycho)-social systems. It challenges educated readers interested in the theoretical integration of humanist and interpretative scholarship with naturalist and theoretical science. It would be an appropriate text for graduate courses in social theory, psychological theory and systems theory.

The work is projected into four volumes, now in different stages of completion.

Volume I, **Synopes in the Void and the Garlands of Maya**, is the most difficult to write. It deals in a non-technical way with foundational issues and intends to provide the orientation for the following technical volumes. The major parts are outlined in detail, and about half of the volume is in draft form.

Volumes II, **Foundations of General Systems Theory**, and III, **Experience and Action**, are completely outlined (in some 45 pages) and all the tables and figures have been produced. Since parts have been

written up for other contexts, both volumes must be written anew in a style appropriate to a systematic, didactic exposition.

Volume IV, **Communication and Control**, is in part outlined and about half is in draft form. Some of this volume will accommodate relevant work still in progress.

II. SYNCOPE IN THE VOID AND THE GARLANDS OF MAYA

A. Beyond the Methodenstreit

The great debate about the proper approach to the life sciences that raged in Central Europe during the first quarter of the Century is now remembered as *der Methodenstreit*. It continues even today in psychology and sociology in an unabated, if much less sophisticated form. The legacy of the Vienna Circle and of the project for a Unified Science, although temporarily suppressed by attacks against positivism and the fading of analytic philosophy during the last decade, is continuing under the banner of General System Theory.

This volume, inspired by such efforts and drawing on latest developments in physics and the life sciences, proposes a synthesis of the humanistic and naturalistic epistemologies, a Cybernetic Phenomenology that goes ***Beyond the Methodenstreit***.

1. Introduction
 - a) *Erklären? -Verstehen?*
 - b) Cybernetic phenomenology
 - c) Local frames
 - d) Throwing out the black box with the input - output system
 - e) Time is of the essence
 - f) Complementarities
2. Preview

B. System

The idea of a **System** is thoroughly explored in Part I.B. After a detailed exposition of the phenomenological and logical **Constitution of Systems** as mental operations resulting in mental constructs, **The Quest for a General System** traces the development of European physics, biology, and metaphysics. It then formulates a set of nested epistemological paradigms. Having established the ontological primacy of Indefiniteness and the epistemological primacy of Experience in the current, postmodern paradigm, it addresses the key issue of **Object and Subject** in a neo-Cartesian manner.

1. Constitution of systems
 - a) General
 - (1) Phenomenology

- (2) System
 - (a) Qualifiers: Concrete - abstract and formal
 - (b) Languages: None, natural and formal
- (3) Units, plexes (metaphors) and forms
 - (a) Micro - mezzo - macro
- b) Units
 - (1) Individuals
 - (2) Groups
 - (3) Aggregates
 - (4) Plena
 - (5) Situated individuals
- c) Plexes
 - (1) Organisms
 - (2) Machines
 - (3) Minds
 - (4) Templates
- d) Forms
 - (1) Deterministic
 - (2) Genetic / Comparative
 - (3) Probabilistic
 - (4) Functional
- e) Summary
- 2. The quest for the general system
 - a) Between the fire and the shadows
 - b) Dream and wakefulness
 - c) Paradise lost and bacchanal gained
 - d) The pre-established hierarchy
 - e) The haunted house of toys
 - f) Syncopes in the void and the garlands of Maya
- 3. Object and subject

C. Significance

Part I.C addresses the issue of **Significance**. After reviewing, in ***Dissipative and Autopoietic Systems***, the physical and biological basis of any theory of living systems, an evolutionary approach to the origin of the complex activity of living systems is formulated in ***Genetic***

and Didactic Programming. The mechanisms of control in living systems, that give rise to the (mentalist) phenomena of experience, action, and conduct, are explored in ***Memes, Herms, and Culture***. The ontological status of *Homo sapiens sapiens* as ***The Cultured Ape*** is formulated, and the epistemological consequences are drawn in ***A Quat-
nion of Metaphors for the Interpretation of Life***.

1. Dissipative and autopoietic systems
2. Genetic and didactic programming
3. Memes, herms, and culture
4. The cultured ape
5. A quaternion of metaphors for the interpretation of life

An ontology of Indefiniteness, an epistemology of Experience, System as the explanatory and Significance as the conceptual (hermeneutic) ideas, living and especially human systems as battlegrounds of Energy and Meaning, and a theoretical pluralism encompassing both naturalist and mentalist approaches: these are the bases from which the two key problems of the *Methodenstreit* and of Unified Science are next approached. They are the problems of Autonomy and Consciousness on the one hand, and the problems of Becoming and Historicity on the other.

D. It's all on the Surface

Part I.D, **It's all on the Surface**, formulates an approach to the analysis of all systems — physical, living, and mental — that can encompass the striking objective and subjective phenomena associated with very complex systems. It proposes cybernetic analysis based on variational principles, which govern the emergence of surfaces that maintain optimal form.

First, we bid ***A Farewell to Black Boxes***, input-output analysis, and the distinction between system and environment. The surface as a system is defined, and interpreted as the locus of experience. The main formal and conceptual consequences of this analytic shift are discussed. Next, the radically disparate epistemologies of an observer interacting with the shell and with the hull of a system are explored, and the theoretic conclusions are applied to a mentalist formulation of social and psychological experience in ***Inspection and Introspection***. Finally, ***Anatta and the Spectral Operators*** applies the ontology of indefiniteness to the self and the epistemology of experience to consciousness.

1. A farewell to black boxes
2. Inspection and introspection
3. *Anatta* and spectral operators

E. Being In Time

The last key issue of the *Methodenstreit* arose out of the intuition expressed from the beginning of Indo-European metaphysics: while objects are extended in space, subjects are extended in time. Part I.E develops an ontology and epistemology of ***Being in Time***, applicable to all systems. A departure from the usual analysis of systems as spatially constituted and synchronically controllable and decomposable is outlined in ***Chaos and Chronos: Temporal Constitution and Diachronic Decomposition of Systems***. A relativistic conception of the life history and of the metamorphoses of modal experience of a living system is formulated in ***Being, Becoming, and Having Been: Space-Binding and Time-Travel by the Itinerant Self***. The problems of a dynamic systems analysis of history are discussed in ***The Myth of Cultural Continuity***.

1. Chaos and Chronos: Temporal constitution and diachronic decomposition of systems
2. Being, becoming, and having been: Space-binding and time-travel by the Itinerant Self
3. The myth of cultural continuity

F. Toward A Postmodern System Theory

The summary part I.F, ***Toward a Postmodern System Analysis***, reviews the steps that have been taken beyond the *Methodenstreit*, and outlines the program of the next three volumes.

III. FOUNDATIONS OF GENERAL SYSTEMS THEORY

Foundations of General Systems Theory will be presented in this volume, first as a set of general problems, then as a set of methods and last as a nested set of paradigms ranging from elementary to postmodern. Background material, exposed in Volume I, Parts I.B, I.D, and I.E, will be treated in technical detail. This volume can be regarded as a graduate level text.

A. The Epistemological Problem

1. Nature of Knowledge
2. Nature of Science
3. Nature of Behavioral Science
4. Systems Analysis

B. Fundamental Analytic Operations

1. Symbols, Connectives, Statements, and Deductive Inference
2. Sets and Variables
3. Relations and Systems

4. Equivalent Descriptions of Systems
 5. Quantifiers and Functions
 6. States and Structures: Their Expression, Transformation, and Conservation
 7. Types
 8. Dimensional and Qualitative Analysis
- C. Fundamental Epistemic Operations
1. Epistemic Discourse
 2. Epistemic Decisions
 3. Science as An Epistemic Institution
- D. Fundamental Explanatory Operations
1. Lexical definition
 2. Interpretation
 3. Explanation
 4. Deductive inference
 5. Nature and Forms of Scientific Explanation
 - a) The Deterministic Form
 - b) The Functional Form
 - c) The Comparative-Genetic Form
 - d) The Probabilistic Form
- E. Fundamental Methodological Operations
1. Interpretation as indicator
 2. Operational definition
 3. Inductive Generalization and Statistical Decisions
 4. Formulation and Testing of Hypotheses
- F. Fundamental Representational Operations
1. Representation
 2. Production
 3. Models, Simulation and Gaming
- G. Aggregation and Reduction
1. Individual, Collective and Derived Properties
 2. Fallacious Aggregation and Reduction
 3. Pseudo-Aggregation and Pseudo-Reduction
 4. Empirical Parameters and Theoretical Terms

in Transformation Equations

IV. EXPERIENCE AND ACTION

Experience and Action are the two central constructs for the analysis of psychological and social systems that have been constituted within the metaphor 'mind'. Other constructs are needed to analyze individual and social systems constituted within other metaphors.

In this volume, general systems theory, as developed in Volume 2, will be employed to formulate a pluralistic theory of living systems. A full exposition will be given to a unified theory of action that formulates individual and social systems within the metaphor 'mind'. Alternative approaches within other metaphors will be systematically outlined.

This volume, treating in technical detail subject matter introduced in Volume I, Part I.C, **Significance**, can be regarded as a graduate level text in bio-(psycho)-social theory. Its scope extends beyond the project formulated by Talcott Parsons.

- A. Introduction
 - 1. The subject matter
 - 2. Ontological, epistemological and system theoretic foundations
 - 3. Living and artificial systems
- B. Cybernetic Phenomenology
- C. Unified Theory of Action
 - 1. General theory of intention
 - a) Special theory of orientation
 - b) Special theory of motivation
 - c) Special theory of decision
 - 2. General theory of interaction
 - a) Groups
 - b) Sodalities
 - 3. General theory of transaction
 - a) Aggregates
 - b) Markets
 - c) Corporations
 - 4. General theory of transformation

- a) Plena
- b) Spectral operators
- c) Sub-surfaces
- d) Sectors

D. Theories of Behavior, Performance and Conduct

V. COMMUNICATION AND CONTROL

Communication and Control are the central mechanisms that explain the origin, persistence, and activity of all systems. In this volume, the system theoretic approach developed in Volumes **I** and **II** shall be further focused to formulate an approach to communication and control. This will be applied to psychological and social systems, as analyzed in Volume **III**. Finally communication and control in artificial systems, such as cyborgs, sociorgs, robots, and cybernetic societies, will be discussed.

A. Evolution of Communication

- 1. Communication without wires
- 2. The physics of communication
- 3. Man's true home is language
- 4. The aliens are coming

B. Control and Chaos

- 1. Power and entropy
- 2. Indefiniteness and history
- 3. The anachronism of the "modern" state
- 4. Regulation of communities

C. I, the Robot

- 1. What in the world would pass a Turing Test?
- 2. Cognitive, cathective and conative automata