Summary of course 3.4. Methodology (1981-1982)

General

This course forms the final piece of the Epistemology–Logic–Methodology triad and deals with the theory regarding the application of logical laws to the various domains of knowledge within reality. Starting from the idea that science is the expression of human life coming to full consciousness of itself, the course analyzes how human beliefs evolve from prescientific methods of fixation (such as C.S. Peirce's methods of tenacity, authority, and a priori) to the scientific method based on the external permanency of facts.

In scientific knowledge acquisition, the empirical cycle functions as a continuous interplay between creative abduction (hypothesis formation), logical deduction, and experimental induction.

In addition, the text investigates the tensions between reductionism (reducing complex phenomena to their smallest building blocks) and holism (recognizing autonomous, irreducible levels of reality), and constructs a system of four fundamental research methods: the semiotic (language-analytic), the deductive (axiomatic), the experimental (reductive), and the direct method (phenomenology, hermeneutics, and the understanding Verstehen method).

1: From prescientific belief to the scientific cycle

Methodology emerges from the convergence of two core philosophies: epistemology (which investigates our cognitive contact with reality) and logic (which tests the validity of our reasonings and implications). Where science in the past was often seen as a detached explanation of nature, modern methodology - in line with Hegel and De Waelhens - emphasizes that scientific knowledge is human life itself coming to a reflexive and clear consciousness of itself. The discovery of knowledge does not begin with an absolute doubting, but with prescientific common sense: the factual, everyday beliefs and certainties that human communities have built up over the centuries.

According to the American thinker C.S. Peirce, man fixes his beliefs in four successive ways:

-*The method of tenacity* : the emotional and stubborn holding on to a once adopted opinion, systematically ignoring all counter-evidence.

-*The method of authority* : the collective imposition and maintenance of dogmas and beliefs by an institution, state, or social group.

-*The a priori method* : philosophical arguing based on personal preferences and rational presuppositions, without factual testing.

-*The method of external permanency* : the real scientific method, relying on the assumption of an objective reality whose properties are independent of what an individual thinker arbitrarily thinks of it.

The scientific method goes through a dynamic and creative cycle. It begins when a researcher is confronted with a surprising or unexplained fact. Through abduction (guessing or formulating a fruitful hypothesis), the mind designs an explanatory rule that makes the fact understandable. Subsequently, through deduction, the researcher derives the logical and necessary consequences of this hypothesis. Finally, through induction, one performs experiments to check whether the predicted facts actually occur in practice. Knowledge development is therefore a 'fruitful circle' in which interpretation and factual testing constantly reinforce each other.

2: Justification, explanation types, and the debate between reductionism and holism

Every scientific claim requires justification or proof. Bochenski distinguishes two main forms of argument in this regard:

-*Direct justification:* takes place when the investigated object is directly present in a sensory or intellectual insight (such as the immediate perception of smoke or contemplating a thought content).

-*Indirect justification*: occurs when the object is absent and the mind is forced into reasoning. This happens via deduction (derivation from known premises) or via reduction (formulating an explanation and verifying it through empirical data).

Within explanation theory, the course shows that 'explaining' is much broader than classical causal-mechanical thinking. Indeed, various explanation types exist:

-*Causal explanations:* reduce a phenomenon to its preceding causes or independent variables.

-*Functional and concomitant explanations:* describe the mutual coherence and interaction within a system.

-*Teleological or final explanations*: interpret a fact from its goal-directedness or function within the whole.

-*Genetic or historical explanations*: make a phenomenon understandable by reconstructing the diachronic chain of its origin.

Verification or testing also has a layered structure: in addition to logical verification (the internal consistency of a formal system) and empirical verification (physical or technical control via measuring equipment),

methodology also recognizes transempirical verification, which applies to non-material, spiritual, or religious realities through specifically appropriate criteria.

In philosophy of science, two major views oppose each other:

-*Reductionism*: wants to systematically reduce complex psychological and social phenomena to the simplest physical and chemical laws.

-*Holism:* rejects this reduction and posits that reality consists of autonomous, irreducible levels. In a process of emergent evolution, completely new properties arise at higher levels (life, consciousness, culture) that cannot be explained from lower levels.

-*Coductionism:* forms the reconciliatory approach which posits that reductionism and holism are not mutually exclusive, but should be used as complementary perspectives.

3: Typology of the four main scientific methods

The course builds a comprehensive typology that divides scientific and philosophical procedures into four fundamental main types:

1. The semiotic or language-analytic method

The semiotic method investigates reality by analyzing the structure of language and the sign system. It makes a sharp distinction between the different semantic language levels:

- *Zero level / Object language:* the direct language that speaks about facts and objects in reality**.**

- *Metalanguage*: the language that speaks about language itself (for example, the analysis of scientific statements or religious texts). This method prevents conceptual confusion by critically dissecting definitions, terminology, and the syntactic, semantic, and pragmatic dimensions of linguistic signs.

2. The deductive or axiomatic method

This method, dominant in mathematics and formalized logistics, replaces everyday colloquial language with an artificial symbol language. It formulates a limited number of independent, consistent, and complete axioms (primitive starting propositions) and derives from them, according to established deduction rules, all other theorems and formulas. This yields an empty, but extremely exact and universally applicable formal language system.

3. The experimental or reductive method

The experimental method forms the heart of the natural and behavioral sciences and goes through the so-called empirical cycle in four clear phases:

- *Observational phase:* establishing a surprising, publicly accessible fact.

- *Descriptive phase*: formulating an exact, operational terminology and taxonomy.

- *Hypothetical phase*: drawing up an abductive hypothesis (lemma) indicating the necessary and sufficient conditions of the fact.

- *Verificative phase:* deductively deriving testable predictions and inductively performing an experiment for control or falsification.

4. The direct methods: Phenomenology, Hermeneutics, and Verstehen

Direct methods investigate phenomena in their immediate givenness to consciousness, without using extensive symbol calculations:

-*The phenomenological method:* wants to directly intuit the experiences and the essence (eidos) of things. This is done by applying the epoché (consciously placing all scientific prejudices, theories, or existential judgments in brackets) in order to penetrate to a pure description of essence.

-*The hermeneutic method:* focuses specifically on interpreting and deciphering meaningful signs, expressions, and historical texts.

-*The understanding method* (Verstehen): placed by W. Dilthey in opposition to natural-scientific explanation (Erklären). Where physical objects are explained from the outside, human behavior requires understanding from within. This calls for participating observation (actively co-experiencing) combined with reflexive distance. The understanding method relies on the fundamental essential identity between the human researcher and the investigated human subject, enabling deep insight into human motives and cultural expressions.