## Course 3.3. Introduction to Logic (1981-1982)

***General***

*This course defines logic as the general science of order and ordering ("Sapientis est ordinare") and as the necessary propedeutic or working instrument (Organon) for all sciences and philosophy. Starting from the fundamental distinction between 'formal' conceptual logic (which focuses on the substantive meaning and eidos of ideas) and modern 'logistics' (which operates with formalized, empty symbolic calculi), the text develops a multifaceted system of classification and order.*

*Through scholastic intentional theory (intentio prima and intentio secunda) and Platonic-Pythagorean harmology, various fundamental structures are analyzed: distributive sets, collective systems, kinetic-diachronic processes, ontological modes of being and idiographic singularities.*

*In the theory of reasoning and implication, the course demonstrates how logic functions through Peirce's trichotomy (deduction, induction and abduction) and through the pragmatic maxim, ultimately showing how logical structures underpin mathematics, scientific methodology and formalized symbolic thought.*

***Summary***

***1: Logic as a Universal Theory of Order and Its Distinction from Logistics***

As St. Thomas Aquinas already formulated: *"Sapientis est ordinare"* – it is characteristic of the wise and rational human being to establish order. In its deepest essence, logic is the general science of order and ordering. Since Aristotle, formal logic has been regarded as the propedeutic or preparatory instrument (*Organon*) for all sciences and philosophy, because it investigates the most universal identities and networks of relations.

The course draws a sharp and essential distinction between classical formal (conceptual) logic and modern logistics:

- *Formal conceptual* logic (Plato, Aristotle, Husserl) is faithful to *forma* and conceptual content. It works with meaningful concepts (*eidos* / concepts) and investigates how contents of thought are connected substantively and logically.

- *Logistics* (Boole, Frege, Russell, Whitehead), by contrast, is a formalized symbolic calculus operating with 'empty' or purely conventional symbols and rules of manipulation. Whereas many types of logistics exist, there has been only one fundamental logic throughout the centuries.

Logic unfolds on two levels: conceptual or pre-apophantic logic (the intuitive structure of the concept) and discursive or apophantic logic (the processing of concepts into judgments and reasonings). Behind all logical properties and inherences lie fundamental identities, whether substantial, qualitative or quantitative, which constitute the intellectual economy of the human mind.

***2: Conceptual Logic, Intentional Theory and Harmology***

A concept (*concept*, *idea*, *eidos*) is a synthetic cognitive model or mental sign within the intellect. The formation of contradiction-free concepts proceeds according to Platonic dialectics:

- *Socratic induction:*

starts from common-language and applicative examples in order to arrive at a regulative definition.

- *Platonic analysis:*

places the concept within the encompassing hierarchy of the universals system.

Every concept possesses a content (*comprehensio* / *connotatio* / *Sinn*) and an extension (*extensio* / *denotatio* / *Bedeutung*). Content and extension are inversely proportional: the greater the content (more specific characteristics), the smaller the extension (fewer individuals to which the concept applies).

Definition analyses content through genus (*genus*) and specific difference (*differentia specifica*); classification analyses extension.

Through scholastic intentional theory we understand the cognitive structure of consciousness:

- Intentio prima: the direct orientation of the mind toward a real or possible object.

- Intentio secunda: the reflexive return of the intellect upon its own acts of thinking, whereby logical entities (*ensa rationis*) arise. Logic is essentially the study of these secondary forms of attention or reflection, corresponding in modern semiotics to the distinction between object language and metalanguage.

The general theory of order or harmology (and taxeology/classification theory) originates in the Pythagorean-Platonic tradition (Archytas of Tarentum) and in St. Augustine (*"Ordo est parium dispariumque rerum sua cuique loca distribuens dispositio"*). Aristotle concretized this in his doctrine of categories (the ten predicaments such as substance, quantity, quality, relation, etc.).

***3: Typology of Ordering Structures: From Set to Individual***

To order reality and our thinking about it, the course distinguishes four fundamental principal structures:

- *Distributive structure* (set theory): a set in which a common property is distributed or spread over each member separately (universal, particular, singular, null case). Each element possesses the property completely and is mutually interchangeable (commutative).

- *Collective structure* (systems theory & cybernetics): a system or whole (*totum*) in which the elements fulfil specific, non-interchangeable functions and relations of mutual dependence. Cybernetic systems process information through reception (input), center (black box), delivery (output) and feedback.

- *Kinetic/diachronic structure* (theory of process and change): structures change and movement (*kinèsis*) in time between immutable invariants and variations. The diachronic sequence of a process has a fixed threefold division: protology (beginning time), kairology (turning point) and eschatology (end time).

- *Idiographic/individuological structure*: concerns the unique, singular, concrete individual (*tode ti* / *prima substantia*) in its specific situation (*hic et nunc*). It distinguishes between full identity (the unique, proper identity of something) and partial identity (its analogous affinity with its environment).

In addition, the course discusses bipolar and differential ordering (in which positions are arranged between extremes) and analogical ordering, which is divided into *proportional analogy* (proportion/metaphor) and *attributive analogy* (systemic coherence/metonymy). At the highest level stands the ontological or transcendental structure: the concept of 'being' encompasses absolutely everything that is 'not-nothing' and constitutes the omnipresent frame of reference of all experience.

***4: Logic of Judgement, Forms of Reasoning and the Pragmatic Method of Knowledge***

In a judgement, a proposition connects a subject (*subiectum* / *onoma*) with a predicate (*praedicatum* / *rhèma*). A judgement expresses an interpretation of reality and affirms or denies that a predicate is inherent in (or implied by) the subject.

***Distributive Reasoning***

In the logic of reasoning (syllogistics), the course examines how a consequent proposition (conclusion) follows from antecedent propositions (premises). C.S. Peirce designed the fundamental trichotomy for distributive inferences:

- *Deduction:* Rule / Application / Result: logically compelling and necessary, but in itself does not teach new facts.
- *Induction:* Application / Result / Rule: probabilistic reasoning that generalizes from a limited sample (*sampling*) to an entire population.
- *Abduction / Retroduction:* Result / Rule / Application: the conjectural problem-solving form that generates a new hypothesis or explanatory model.

***Non-distributive Reasoning***

Non-distributive reasoning is based on collective systemic relations, kinetic developments, ontological principles (the principles of identity and non-contradiction) and idiographic authenticity.

Through the lemmatic-analytical method (Vaihinger's and Plato's *as-if behavior*), science reasons from an assumption or lemma. Peirce elaborated this in his famous pragmatic maxim: the cognitive content of a concept or hypothesis is entirely contained in the observable, practical and experimental effects attributed to it. This corresponds seamlessly with the evangelical adage: "By their fruits you shall know them."

Finally, the course shows how mathematical implication generalizes reality through variables and refines it through miniaturization, while logistic implication creates an artificial, axiomatic language (using functors such as conjunction, disjunction, implication, negation and quantifiers) in order to describe exactly all conceivable structures of the universe.