4. 8 Logicisms

Content

4. 8. 1 Logicisms

Bibl. st. : M. Müller/ A Helder, *Herders kleines philosophisches Wörterbuch*, Basel / Freiburg / Munich, 1959-2, 100. A way of thinking, if it prioritizes either formal or formalized logic as the pre-eminent basis of thinking (and acting), is a logicism. I.M. Bochenski (1902/1995) sees three major peaks in the development of Western thought: classical antiquity (fourth/third century), the Middle Ages (twelfth/thirteenth centuries), modernity (nineteenth/twentieth century). They form the basis of logicisms. We now go over the most notable ones.

Socratic reasoning skills ("dialectics"). Socrates of Athens (-470/-399) argued with the sophists about conscientiousness and statehood, among other things, inductively in order to arrive at general definitions. The general concept was immediately central. This can pass as the first logicism of note. Which Plato 's dialectic will further elaborate.

Aristotle's Organon (thinking tool). The first and second analytics form the core of the first comprehensive logical system of Western culture. Through reorganizations, innovations, additions, circumlocutions, reconstitutions, this continues to dominate thought until our days. It is called "classical logic."

Fundamental logicist system. Stoa. Stoics later founded their own theory of thought that differs from Platonic-Aristotelian logic. It contains approaches that refer to later logistics. Also thoroughly logicist.

Scholastics. The medieval thinkers reclaim, re-establish ancient logics. Scholasticism is fundamentally logicist.

Christian Wolff (1679/1754), the German rationalist, and his fellow thinkers was a logicist with his "ars rationalis" or also "scientia rationalis" (the names for logic).

Logic. Prepared by the logical algebra of G. Boole (1815/1864), mathematical logic took off: G. Frege (1848/1925) wanted a mathematical-style logic in the wake of G. Leibniz (1646/1716). Figures such as B. Russell (1872/1970) and AN. Whitehead (1861/1947) elaborated this in their *Principia mathematica* (1910/1913), a masterpiece of logicism. O. Houdé, *Logicism / psychologism*, in: O. Houdé et al, *Vocabulaire de sciences cognitives*, PUF, 1998, 247/250, argues - with G. Hottis, *Penser la logique*, Bruxelles, 1998 - that an unambiguous definition of "logics" is impracticable. Houdé notes that one feature of Frege and Russell's logicism stands out: the reduction of mathematics to logistics. Which was rejected by H. Poincaré (1854/1912) and L. Brunschvicg (1869/1944). More so, K. Gödel (1906/1978) showed the impracticability of that aspect by demonstrating the thorough boundedness of formalizing (in 1931).

E. Husserl (1859/1938) - following in the footsteps of B. Bolzano (1761/1840) - stripped logic of any psychologism: the strict generality of the laws of logic, if explained naturalistically (a.k.a. psychologically), is toned down to a kind of approximate "generalities. As a phenomenologist, he argues that the object of logic shows an objectivity and generality directly given in consciousness. Husserl is thoroughly logicist.

Note: I. Kant (1724/1804), developed a "transcendental dialectic," a kind of epistemology concerning the basic concepts of traditional metaphysics. He tries to prove that what he dismisses as "the ideas of (metaphysical) reason," i.e. God, soul, freedom, immortality, because nothing of these can be established in our sensory experience, are pure products of metaphysical reason. One understands the term "transendental" as "criticizing metaphysics" which is at best applied logic and in fact scientific theory.

Doctrine of Knowledge. Others in Kant's wake tried to develop a pure theory of knowledge without the Kantian presuppositions. They then gave this the name "logic. But even that remains at best applied logic and science theory. But as with Kant, there too a logicism is at work.

4. 8. 2 Reasoning theories

Basic understanding. Any theory of reasoning must at a minimum remain logic. With I.M. Bochenski, *Philosophical methods in modern science,* Utrecht/Antwerp, 1961, 18v., one can

define "logic" as "the exposition concerning logical laws. He interprets this as "theory concerning propositions that account for the deduction of true statements from true statements." A more traditional definition would read, "The theory concerning understanding and judgment as accounting for valid reasoning."

Testability. O.c., 78, Bochenski says that R. Carnap (1891/1970) advocated his principle of tolerance of testability: "Everyone is free to determine what kind of verifiability one considers permissible." Purely democratic this is true. It is also purely methodically justifiable. But ontologically, i.e. paying attention to overall reality, this can apply in a limited way. Thus: if one eliminates the principle of contradiction, one can methodically construct a set of sentences but, once that set of sentences has been tested against the total reality, this is untenable, - hegelian expressed 'unreal' (given and requested disregarding).

Types of logic. We go over some of them.

1. Philosophical and non-philosophical theory of thought. In a review of G. Gabbay / Guenther, eds., *Handbook of Philosophical Logic*, 4 dln., Dordrecht, 1983/1989, says R. Vergauwen, *Philosophical logic (A status quaestionis),* in: *Tijdschr. v. Philosophy* (Leuven) 55 (1993): 12 (Mar), 141/150 : "What exactly philosophical logic is and how it relates to, e.g., mathematical logic, is apparently not so clearly definable, even from this Handbook."

Usually "philosophical logic" means that theory of thought that does not use language derived from mathematics. Let's leave it at that.

2. Realist and constructivist logic. O. Houdé, *Logicism / Psychologism*, in: O. Houdé et al, Vocabulaire *de sciences cognitives (Neurosciences, psychologie, intelligence artificielle, linguistique et philosophie),* PUF, 1998,247/250, translates an old distinction into cognitivist sense. Traditional. If logical language refers to reality beyond language signs, then it is "realist" (usually "conceptualist"). If, however, it is merely a system of linguistic signs which is in itself (without striking at reality outside those signs) a concatenation of sentences, then it is 'constructivist,' i.e., a pure mind construction. Cognitivist. If language signs are representations of data existing outside the human brain and thus usable in physics, biology, psychology and other cognitive sciences, then logic expressing itself in this way is 'realist'. If logic presents only products of the contiguous mind, i.e. neuronal activity and symbol system in the brain, then it is "constructivist. Which is, after all, a very biologistic interpretation.

3. Psychologic/logicist theory of thought. Houdé in the wake of M. Richelle defines. Mathematical logicians, if they interpret their logistics as describing thinking as mental activity within the psyché of man, are up to 'psychologism'. Psychologists, if they employ logistics to create order in their specialty, are up to 'logicism'. M. Richelle even calls this a form of tinkering which, in my opinion, is not necessarily so. John Stuart

Mill (1806/1873) who wrote a work on deductive and inductive logic (1843), and G. Boole (1815/1864) who wrote *An Investigation of the Laws of thought* (1854), which set forth algebraic concepts and methods as applicable to non-mathematical data, were psychologists. For example, Mill argued that the origin of logical laws lies totally in man's psychic nature. An example: the law of contradiction has as its raison d'être a "belief ("It is") and an opposite "belief ("It is not") which are mutually exclusive only within the soul life of man. That they are mutually exclusive in themselves does not come into its own.

4. Biologistic thinking. Houdé, in the wake of P. Engel, *La norme du vrai*

(Philosophie de la logique), Paris, 1989, argues that a current "logicism" interprets psychological data - o.g., fragments of logics. On the one hand, it excludes any introspection such that the object of psychology - mental processes - is no longer limited to mere subjective representations. On the other hand, one excludes behaviorism - which considered mental processes unobservable due to its too narrow method - due to physically and biologically observable aspects of psychic life as elaborated by the cognitive sciences. Two directions work this out, J. Piaget's genetic psychology (1896/1980) and cognitivist psychology. Houdé calls both directions what he understands by "logicism.

Piaget. The axiom reads, "Biological ontogeny shows that all human subjects exhibit an endogenous (coming from within) activity that - as a result of biological evolution - reaches states of logistic nature." According to Houdé, those "states" include an operative logistics with groups of operations (thought operations) with combinatorics (symbol connections) and with a group of "formal" (understand: formalized) operations. More than that: those states correspond to optimal, elevating formations of structures proper to the pre-existing characteristics of the world. Which implies a kind of "logical realism." But Piaget never intended a reduction of psychology to logistics. In fact, he limits himself to one interpretation of logistics and immediately of psychology.

Cognitivist logicism. Bibl. st.: O. Houdé / B. Mazoyer / N. Tzourio-Mazoyer, *Cerveau et psychologie (Introduction à l'imagerie cérébrale et fonctionelle),* PUF, 2002, 547/582 (Le raisonnement logique). In the mid-20th century, the pioneers of cognitive science - in the

context of cybernetics (with Alan Turing, Warren McCulloch, Walter Pitts, John von Neumann and others) - placed great importance on the relationship between brain functioning and logics. This logicism was readily summarized in McCulloch and Pitts' seminal article entitled: *A Logical Calculus of the Ideas Immanent in Nervous Activity* (1943). It was understood: the nervous system with its "operations" contains a logical calculus (arithmetic) such that logistics is the appropriate subject for analyzing the workings of the brain. Axiom: "The brain is a deductive machine whose components - the neurons - embody logistic principles." Behold the essentials of that tenet of which a more precise exposition would take us too far here.

Note: Both strands are a form of logicism in that they prioritize either logical algebra or logistics as "logic" but they remain a form of psychologism in that they allow thought operations to emerge thoroughly from mental life and they are a biologism in that they conceive of that mental life as evolutionary - biological facts.

5. Philosophical philosophy of life. Bibl. st.: O. Bollnow, *Zum Begriff der hermeneutischen Logik,* in: O. Pöggeler, Hrsg., *Hermeneutische Philosophie*, Munich, 1972, 100/122.

Philosophy of life (also called "vitalism") - emerging since Romanticism (1790+) - puts "life" (in a plurality of meanings) at the center, - often in contrast to rationalism (in its many forms).

Introduction. Logic-hostile movements have an ancient history in the history of philosophy. They are based on a widely spread doubt about the possibilities of human reasoning ability. Which leads to some form of "irrationalism. For example, the irrationalist movement around 1770 that emanated from J.W. Goethe (1749/1832), among others, and was given the name "Sturm und Drang": its adherents considered themselves "Kraftgenies" who despised business thinking as well as the logic that expounds its laws. This is expressed, for example, in the schoolroom scene of Goethess Faust with its staged mockery of the Collegium logicum. Axiom: "Only in feeling and drive is 'real life' to be lived". This was the reaction against the arid rationalism of those days with its concepts and systems of reasoning that were alien to life. In the name of "living life"!

Two philosophical strains of life give logic a place!!! W. Dilthey (1833/1911) and especially G. Misch from Dilthey's school reestablish the foundations of logic. As axiomatic they put forward typical concepts of life such as "life," "living," "lively," - "organic" (i.e., what if an organism (plant, animal, human) shows coherence),- "development" (all life never stands

still). On this basis, all other concepts are redefined, indeed, derived. 2. Moderate vital logic takes the concepts as they are traditionally given in logic but situates them "in life" by realizing that intelligible thinking is indispensable.

6. Pragmatist Theory of Thought. This direction is somewhat related to the philosophical of life because it too situates the concepts in "life" but in such a way that only the putting into practice of concepts shows the correct content. W. James (1842/1910), Ch. Peirce (1839/1914), J. Dewey (1859/1952) are distinguished representatives who differ among themselves rather thoroughly. We note that Peirce, among others, is the founder of a part of logistics, namely relations calculus.

Note: Peirce says the Bible is one of the precursors to his pragmatism (a variant of pragmatism). Read Matthew 7:15/27. There Jesus says that one knows false prophets by their fruit: "Does one pick grapes on thorns? Or figs on thistles?". Likewise, one knows the true disciples by their fruits: To listen to Jesus' words is good but to put them into practice is to be a true disciple. In other words: the result in practice decides.

7. Dialectical theory of thought. "Dialectic" is paying attention to the totality (collection, system) of evolving elements, as expounded by P. Foulquié, *La dialectique*, Paris, 1949. Platonic dialectics grew out of the debating skills founded by Socrates, Plato's teacher. Concepts, judgments, reasoning form with Plato a network of logical - metaphysical nature. One of them cannot be understood without the rest. Deduction ('sunthesis') and reduction ('analusis'), socratic induction (the summative included), lemmatic - analytical reasoning had their place in Platonic dialectics. The Hegelian dialectic is a modern revival of that of Plato by G. Hegel (1770/1831). In that language

'mind' the ability to combine separate thought contents in life-altering ('abstract') ways. This he blames on the logic of his time.

By the way: Hegel underwent strong Romantic influence. What he calls "Vernunft" ("reason") is the dialectical thinking that articulates totality - in - development of "moments" (understand: evolving elements). By this he thinks he can represent living reality. K. Marx (1818/1883) revived the Hegelian dialectic in the materialist sense: matter is the totality in evolution (possibly in revolution) of interrelated elements. Which he applies particularly to socio-economic life. Praxis, however, is only the full Marxist life. Something through which he approaches the philosophy of life and pragmatism. Note: Existentialism (in its many forms) shows some kinship with the previous schools of thought: "to exist" is to be thrown into the

world but in such a way that, while alive, one engages in a design concerning that world. The difference is that existential thinking is rather skeptical of everything that calls itself "logicism," including Hegelian logicism because, although Hegel is strongly philosophical about life, he begins his metaphysics with a dialectical logic.

Up to there some overview concerning a number of types of thinking logic. We repeat: they are logic to the extent that they presuppose laws of thought which lead from true sentences to true sentences, or that they presuppose concepts and judgments which justify valid reasoning. But one sees it: that logical core is embedded in a set of presuppositions that amount to a philosophical interpretation of logic. In this sense, they are philosophical logics. Or philosophies of logic. See the title 'elements' (initio).

4. 8. 3. This chapter summarized:

Human science for the ancient Greeks had to do with virtue. A number of Enlightenment philosophers approached man rather reductively. While

Kant sees in "man" the pedestal of all sciences. For Hegel, man is embedded in a comprehensive mind, while Compte reduces man to social facts. Legrand believes that human science has reduced man too much to facts and statistics and denounces the lack of unity in the methods followed. In turn, it can be argued against Legrand that his review makes no mention of the humanities method, nor of the cognitive sciences.

Cortois sees within the Western world two disparate culture types: The alpha - sciences, (the literary) and the beta - sciences (the physical). However, this discord is much older. With Lepenies, however, one can conclude that economics is a rock-hard science that hardly takes into account people and their cultural context. This forces economists to take non-economic data into account in their theory. This leads to an updating of established economic science, giving it a more human face. Immediately the human sciences acquire a moral-social dimension. In addition to the alpha and beta sciences, there are now also the gamma sciences.

Mironesco advocates a greater rapprochement between hard and soft sciences. She refers to Darwin, who clearly claims to rely on Malthus and his economic theory.

Büchner, in his Kraft und Stoff, wants to eliminate all that is immaterial from human knowledge. Lange agrees with this view, but only as a method of scientific investigation, not as a philosophical worldview. Büchner, in his Kraft und Stoff, wants to banish everything immaterial from human knowledge. Lange agrees with this view, but only as a method of

scientific investigation, not as a philosophical worldview. In the latter case, it becomes an ideology because it neglects the immaterial in the totality of reality. For example, the materialist worldview interprets consciousness in coherence models, not in likeness models. "Being" and "material being" are then wrongly identified. The materialist thus avoids addressing the question of what consciousness essentially is.

A physically operational definition comes about through experimentation in which physical measuring instruments record objective values. This succeeds, for example, by recording cold - experiences in a scientific way. Traditionally, one had to rely on a number of more subjective descriptions when sensing different intensities of cold.

Heisenberg's uncertainty axiom posits as an axiom that the simultaneous measurement of the location and velocity of a physical particle is impracticable, so that only a statistical determination of location is possible. The classical axiom of causality - namely, that only what is observable in a measurable and experimentally testable way exists - implies that if one thinks of them in conjunction with the uncertainty axiom expressed above, one rejects the classical axiom of causality. Heisenberg puts only the measurable and experimentally testable reason first and thus does not pronounce on reason without more. Location and velocity of e.g. a particle - each have their 'reason'. So in the end the relation between the two quantities is not so 'uncertain' ... if one is willing to accept the radical limitation of physics insofar as it presupposes only the measurable and experimentally testable.

A theory must be objectively testable, then it is "operational. Such operationalism, applied to human behavior, easily leads to a form of behaviorism and physicalism. It may be obvious to a thirsty person that he is thirsty. Yet this is not a scientific fact, because it is not operationally testable. It does become testable through what is associated with it: if, for example, he stubbornly seeks drink, or if his lack of drink leads to medically ascertainable consequences. The fellow man, who has also known thirst, and therefore knows - by parable - what it is to be thirsty, is scientifically irrelevant. The operational method only grasps what is related to thirst, not what is similar to it. That is its weakness. Therefore, human science that truly wants to understand fellow human beings will far exceed the operational method.

The cognitive sciences have experienced a stormy development since the 1950s. Five basic sciences emerge from it: psychology, artificial intelligence, brain science, philosophy of mind and linguistics.

The term "mind" no longer has its classical meaning, but is taken very materialistically.

From a variety of disciplines, researchers have not yet succeeded in arriving at a single conclusive science of cognition. The concept of 'mind' is seen here as a system of information processing. Philosophy is then only a unified theory about machines, brains and 'mind'. Any reflection about knowledge coincides with that knowledge, leading to scientism. Philosophizing then in fact coincides with cognitive science.

A way of thinking that prioritizes logic as its foundation is a logicism. For example, classical logic as practiced by Socrates and Plato, among others, is a logicism. The stoa deviates from this and contains approaches to logics. Medieval scholasticism is also logicism.

In the mid-19th century, mathematical logic took off. E. Husserl stripped logic of any psychologism.

Logic can traditionally be defined as the theory of understanding and judgment as justification for valid reasoning. Tolerance of testability that eliminates contradiction leads ontologically to unreal reasoning.

We concluded this summary by listing some types.