AXIOMATIZATION (Greek, **αξιομα** [axioma]—dignity, weight, value)—an operation transofmring a given domain of knowledge into an axiomatic system.

The axiomaticization of a domain consists in presenting for it an axiomatic and a set of rules of inference, and in selecting from among its terms primary terms, namely those that occur in axioms and are sufficient for the definition of the other terms.

We should distinguish between axiomatization and symbolization. Symbolization consists in replacing expressions with individual latters and introducing variable symbols. Axiomatization also differs from formalization, which consists in creating a formalized deductive theory. Among the advantages of axiomaticization are the following: it shows deductive connections between the assertions of given theory; it makes it possible to render the meanings of concepts associated with the theory uniform; it facilitates the description of the theory's essential features; it increases the degree of objectivity; and it reveals presuppositions.

The question of axiomatization is presented in various ways depending upon the domain that has been axiomatized.

IN THE FORMAL SCIENCES at the end of the nineteenth and beginning of the twentieth century there were many accomplishments in the area of axiomatization. Some of the fields that were axiomatized were the classical propositional calculus (Frege 1879), the classical logical calculus (Russell, Whitehead 1910–1913, Ackermann, Hilbert 1928), Euclidean geometry (Peano 1889), the arithmetic of real numbers (Tarski 1937),set theory (Zermelo 1908), and probability theory (Kołmogorow 1933). In 1931 K. Gödel demonstrated that a full axiomaticizatio of a theory containing the arithmetic of natural numbers with addition and multiplication is impossible. This finding shows the limits in the axiomitization of richer formal systems.

IN THE REAL SCIENCES (the natural and human sciences), the most important attempts at axiomatization were in physics. P. Suppes and his students obtained particularly interesting results within the structuralist movement in the philosophy of science. The axiomatization of theory is conceived somewhat differently than in metalogic. Axiomatization is not carried out in formal language. It is carried out in the non-axiomatic (intuitive) language of set theory, and no distinction is made between all axioms and primary terms; when derivates theses are introduced, an appeal is made to evident propositions that were not previously indicated, and these propositons are based on what is called physical intuition. The fields that have been axiomatized in this way include the classical mechanics of the material point (McKinsey, Sugar, Suppes 1953), the relativistic mechanics of the material point (the particular theory of relativity) (Suppes 1959), the classical mechanics of the stable body (Adams 1959), and classical thermodynamics (Moulines 1975).

IN CLASSICAL PHILOSOPHY the attempts at axiomatization extend to J. Salamucha's formal reconstruction of the proof for the existence of God, published in 1934. Most frequent are attempts to axiomatize Thomas' proofs for the existence of God (I. M. Bocheński also presented an attempt at the axiomatization of the proof for the existence of the soul). The proofs for the existence of God that are particularly subject to aziomatization are the argument from motion, from the efficient cause, and from the contingency of being. In the philosophy of God there have also been attempts at the axiomatization of the

ontological argument (C. Hartshorne, R. Adams, K. Gödel). Two questions appear in connection with these attempts: are the axiomatizaitons in fact performed correctly?; and, is any correct axiomatization of classical philosophy, or a fragment thereof, possible? As for the first question, many of the attempts up to this time have been shown to be burdened with errors: *ignoratio elenchi*, *petitio principii*, equivocation, and connection ("Since every part of X is F, then X is F.") In the Lublin School (S. Kamiński, M. A. Krąpiec), the second question is answered with a negative. They present the following reasons why the axiomatization of the entire Thomastic philosophy of being, or fragments thereof, is impossible: (a) the analogical character of the language of metaphysics; (b) the deductive independence of the assertions of metaphysics; (c) the dpends of the relations of inference upon the content rather than upon the form of expressions; (d) the inadequacy of the language of logic, namely that logical invariables express the categorical and structural properties of the world, but do not express the world under the aspect of existence in general, and that the variables in systems of formal logic concern the set of all object, but not the set of the subontological components of being. They show, however, that the question of the application of logic to classical philosophy is a different question from the second question. E. Nieznański suggests that axiomatic systems constructed in connection with the problems of classical philosophy may be treated not as translations of fragments of that philosophy into the language of logic, but as attempts to resolve these problems by differents methods and to express them in another language.

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