Volume 4, no. 4 (October 1994)

EVANDRO AGAZZI'S CONTRIBUTIONS TO LOGIC

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Evandro Agazzi was born in Bergamo, Italy on October 23, 1934. He graduated from the Catholic University of Milan, and subsequently studied at the Universities of Münster (Germany) and Oxford (U.K.). Following a period of teaching responsibilities in the Italian high schools, he became in 1970 Professor of Philosophy of Science in the Humanities Faculty of the University of Genoa, while at the same time teaching mathematical logic in the Mathematical and Natural Sciences Faculty of the University of Genoa and in the Humanities Faculty of the Catholic University of Milan. Agazzi was for many years President of the Italian Philosophical Society (S.F.I.) and of the Italian Society of Logic and Philosophy of Science (S.I.L.F.S.). In 1979, while retaining his chair at the the University of Genoa, he was appointed Professor of Philosophy of Science, Philosophy of Nature and Philosophical Anthropology at the University of Fribourg (Switzerland), a position which he still holds today. In the meanwhile, Agazzi was elected President of the Académie International de Philosophie des Sciences and served first as Secretary General, and then as President of the Fédération des Sociétés de Philosophie (F.I.S.P.). He resigned from the last position in 1993 after four terms of service, and remains an Honorary Presiedent of the F.I.S.P. In the same year, he was elected President of the International Institute of Philosophy (Paris). He was a Visiting Professor at many universities from all over the world, some of which even awarded him with degrees *ad honorem*. Agazzi currently is the editor of the journals *Epistemologia* (an Italian journal for the philosophy of science) and *Nuova Secondaria*, and is a member of the scientific board of many philosophical journals, among which are *Erkenntnis*, *Modern Logic*, *Zeitschrift für allgemeine Wissenschaftstheorie*, *Revue International de Philosophie*, and *Kos*.

Since the beginning of his academic career, Evandro Agazzi managed to balance his strong interest in logic with the commitment to explore the foundations of the scientific enterprise and the relationships between science and ethics. This means that, although making significant contributions to logic itself, he always conceived of this fundamental

discipline as a tool for rendering scientific and ethical discourse more precise. In this sense, Agazzi preserves, on the one hand, the best aspects of the analytic tradition, without endorsing, on the other, the over-valuation of linguistic analysis which so often characterizes the theses of this school of thought.

We may note that, significantly, Agazzi's first book was dedicated to logical issues. In 1961, in fact, he published *Introduzione ai problemi dell'assiomatica* ([An Introduction to the Problems of Axiomatics], Milan, Vita e Pensario). This work offers a complete survey of the modern axiomatic method, from both the historical and the theoretical viewpoints. It had a great impact on the Italian philosophical community which, at that time, was still dominated by Croce's and Gentile's neo-idealism. The volume also contains the first Italian translation of Kurt Gödel's "Über formal unentscheidbare Sätze der *Principia Mathematica* und verwandter Systeme". Even Agazzi's second book, *La logica simbolica* ([Symbolic Logic], Brescia, La Scuola, 1964), is devoted to logic. It is a handbook of formal logic which, besides offering a presentation of the classical propositional and predicate calculi and of the main meta-theoretical problems, also pays particular attention to both historical and philosophical problems of logic. This is an original approach indeed, because most logic textbooks ignore the historical development of logic and its relationships with such traditional areas of philosophy as metaphysics, ontology, and the theory of knowledge. Agazzi's logic textbook has had many editions, and in the latest one — published in 1990 — some new paragraphs were added devoted to non-classical logics. The book was subsequently translated into Spanish.

In 1981 Agazzi edited an important work titled *Modern Logic: A Survey* (Dordrecht, Reidel), which was also published in Italy under the title *Logiche moderne* (Rome, Istituto della Enciclopedia Italiana, 2 vols.). One can find in it contributions by the best specialists in all the main sectors of contemporary logic, inclusing, for instance, modal logic, temporal loogic, relevance logic, Leśniewski's systems, many-valued logic, epistemic systems, etc. This work therfore offers a complete and up-to-date survey of the current state of logical research considered from the technical, historical, and philosophical viewpoints. Furthermore, Agazzi always paid much attention to the logic of empirical theories, and in this field he contributed the seminal paper "The Concept of Empirical Data. Proposal for an Intensional Semantics of Empirical Theories" (in M. Przelecki & R. Wojcicki (editors), *Formal Methods in the Methodology of Empirical Sciences* (Dordrecht, Reidel, 1976), pp. 143–157). In this well known essay, he criticized the inadequacies of extensional semantics in a period when such criticisms were not as widespread as they are today, and he sketched instead an intensional semantics based on the classical notion of *intentio*. Such a step gave him the opportunity to offer a new solution to the problems posed by the application of mathematics to empirical reality.

This also depended on his having always clearly distinguished the formal-syntactic, the intensional-semantic, and the extensional-referential levels of logic and formalized theories,

with their mutual interplays. This fact led him to recognize a genuine "semantic function" of the axiomatic method on the one side, but also to overcome a purely formmalistic view of mathematical theories on the other. Relevant to this issue is his paper "Les mathématiques comme théories et comme langage," in *Langage et pensée mathématiques* (Luxembourg, Centre Universitaire de Luxembourg, 1977; pp. 15–32); this paper was subsequently translated into Italian with the title "Le matematiche come teorie e come linguaggio" in *Epistemologia* **I** (1978), pp. 165–182. All these investigations are based both upon theoretical reflections and historical considerations of salient moments in the history of logic, mathematics, and othjer disciplines. A recent contribution by him to a collective volume ("On Formalism," in G. Floistad (editor), *Philosophical Problems Today*, vol. 1 (Dordrecht, Kluwer, 1994), 75–137) is a good example of the way historical and theoretical speculations interact in Agazzi's approach to logic and the philosophy of science. Another seminal paper by Agazzi is "Logica matematica e logica filosofica" ([Mathematical Logic and Philosophical Logic], *Epistemologia* **IX**, n. 2 (1986), 281–308). Noting that the relationships between logic and philosophy cannot be ignored because the specific logical problems have a close kinship to philosophy, Agazzi states in this work that mathematical logic must not be identified with logic *tout court*. In our century, mathematical logic has in fact developed as the logic *of* mathematics, and this means that philosophical logic, despite many opposng opinions, is both meaningful and precious.

We would like to mention here many other works by Agazzi: he in fact wrote or edited about 30 books and published over 300 journal articles and contributions to volumes, anthologies, and encyclopedias. Obvious reasons of space, unfortunately, prevent us from doing this. However, the latest essay quoted above offers the key for evaluating the deepest meaning of his contributions to the logic of our century. Noting that logic should never forget its philosophical roots, Agazzi shows that sound criteria of professional rigour are not an *exclusive* feature of mathematics, provided, of course, we take philosophy to be a serious endeavour, and not a sort of meaningless discourse as many thinkers nowadays claim.