ON THIS JOURNAL'S NEW EDITORIAL POLICY UNDER THE AUSPICES OF POLISH ASSOCIATION FOR LOGIC AND PHILOSOPHY OF SCIENCE

Logic is one of a trivium of conceivable sciences: formal grammar, formal logic and formal rhetoric.
Charles S. Peirce, *On a New List of Categories,* 1868

1. When this journal started to appear in 1980, its title *Studies in Logic, Grammar and Rhetoric* (abbr. *Studies*) was meant to respect the historical tradition of Trivium going back to Antiquity, Middle Ages and Renessaince.[1]

In the first issues, the endeavour to join the present with the past was excellently represented by Guido Küng's (University of Fribourg, Switzerland) study *Abelard and present-day views on the problem of universals*. At the same time, the Editors endorsed Peirce's idea that a modern approach to Trivium should consist in a formal treatment not only of logic but grammar and rhetoric as well. An exemplary piece of modern formal rhetoric was supplied with Kuno Lorenz's (University of Saabrücken) contribution *Main ideas of Dialogic Logic*. As representing formal grammar, one may mention Lynne Broughton's (University of Melbourn) *Empiricism and innate structure*, a paper dealing with philosophical aspects of Chomski's grammars, and Vesco Marinov's (Stanford University) *Computer understanding of mathematical proofs* – on syntactic and logical issues of automatic proof checking.

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[1] It is in order to list the persons most involved. At the start, the journal was edited by Witold Marciszewski and Jerzy Kopania, then by Jerzy Kopania and Halina Święczkowska, and then, for may years up to-day, by Halina Święczkowska herself. Electronic version (logika.uwb.edu.pl/studies/) is run by Mariusz Giero. The title owner is the University of Białystok, Poland.

The historical approach to logic, grammar and rhetoric (in their formal aspects) took a new turn with the volume of 1998 entitled: *Emil L. Post and the Problem of Mechanical Provability*, issued to commemorate the centenary of Post's birth (1897 in Augustów, Białystok region in Poland).[2] This new line is discussed in the last section of this Policy Statement, while in the next section, following this introductory one, it is in order to dwell on the relationship between *Studies* and Polish Association for Logic and Philosophy of Science (henceforth called Association) – as recently arisen with obtaining its auspices by *Studies* What may such a relation mean?

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2. The Association (whose history is told in this volume's Chronicle Section), at its General Assembly of 2006, unanimously agreed to define its relation to *Studies* with the phrase 'under the auspices'. To fill it up with a practical content, it has been established that (i) two representatives of Association enter the Editorial Committee, (ii) special part in each volume is to report on recent events in the life of Asscіation, as conferences, seminars, etc., (iii) Association members receive a free copy of each volume. With the last item it is implicitly assumed that such a competent audience should prove helpful in critical assesment of the journal's content and its scholarly standards. No formal obligations have been imposed in this respect,

[2] To exemplify the content of that volume, refereed by J. Pogonowski (Poznań), let me mention some contributions closest to Post's legacy: R. Murawski (Poznań), *E. L. Post and the development of mathematical logic and recursion theory*; E. Orłowska (Warsaw), *Post algebras and Post logics*, G. Malinowski (Łódź), *Many-valued Post logic*; Z. Sadowski (Białystok), *On the development of Emil Post's ideas in structural complexity theory*; W. Dańko and J. Koszelew (Białystok), *The Post correspondence problem as a tool for proving undecidability in logics for probabilistic programs*; P. Wojtylak (Katowice), *Axiomatizability of logical matrices*; W. Marciszewski (Białystok), *Post's problem of creativity and 'Nature as Infinite Intelligence'*.

but the Editors believe in spontaneous reactions of proficient addressees.

Besides those official agreements, there are new chances and opportunities resulting from such an alliance. The Editors, enjoying the constant support of the University of Białystok, occasional grants from state authorities, and backed by their many years organizational experience in publishing *Studies*, can provide a forum for promoting Polish logic abroad. One may make a sceptical comment to the effect that strong academic teams do not need promotion, as having international contacts of their own, while weak teams are not worth promoting. However, the truth is more complex.

First, publishing papers in foreign journals happens to be a long and cumbersome process because of restrictive peering procedures. Obviously, it is desirable in academic career to undergo such tests, but this need not to be the unique path of publishing in foreign langages. Sometimes, having a publication sooner or receiving quickly a comment for further discussion is more needed than having an approval of foreign journal peers. Note that for refereeing purposes there are experts also in this country, more easily accessible. Readiness to act as referees is likely to be found among the Association members, once they acknowledge *Studies* as a forum of theirs. In fact, the present frequency of appearing, just once a year, is a handicap, but there is a chance of increase in frequency, first up to appearing twice a year, and next more often.

Second, Polish authors happen to have problems with linguistic quality in which no assistance of foreign publishers can be expected. In the case when a contribution is really worth to appear, while the author is not able to obtain linguistic consulting by himself, *Studies* Editors may offer an appropriate support for Association members.

Third, the Editors intend to conduct active policy toward providing a picture of logic and related fields – including informatics and philosophy of science – in Poland. The interest in Polish logic still remains vivid in foreign academic circles, even if somewhat fading lastly. To make this interest more vivid yet, through displaying a survey of interests, trends, problems and results in logic in Poland,

is a challenge worth to be jointly met by Association and *Studies*. This might be accomplished through editing special volumes to present achievements of particular departments or centres of logic in Poland. After so surveying a number of units, a clearer and more complete picture of logic in this country would emerge.

Whether these projects will succeed, depends on improving distribution strategy so that *Studies* arrive at several tens of more significant centres of logic abroad. At the first stage it is feasible only by distribution of free copies, together with introductory letters to suggest a collaboration between receivers and those Polish centres (as represented in *Studies* content) which share receivers' interests. To obtain resources for such an action, *Studies* will require a more intensive support of the University of Białystok as the administrative base. The Editors will do their best to obtain such a support. They expect understanding that the University's image, both in the country and abroad, would considerably profit after the University's journal more visibly enters international scene.

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3. Being open to a wide spectrum of issues does not rule out that the journal might have its cherished subject, one being both significant for science, and not having an appropriate forum yet. From the very start, the journal was much occupied with informatics, in particular with the automated theorem proving and checking. Informatics is meant here as *the study of the structure, behaviour, and interactions of natural and engineered computational systems* (so defined, e.g., in Edinburgh School of Informatics). Thus construed, informatics subsumes computer science, AI studies, cognitive science, computational modelling, etc.

In the nineties, focus of *Studies* shifted from the automated theorem proving to another point. The latter can be defined as *Algorithmic vs Non-Algorithmic Problem-Solving Ability*. The problem-solving ability amounts to what one calls *intelligence*, hence the issue is related to AI studies. The idea of non-algorithmic problem-solving may be best explained by equating it with Alan Turing's

[1938] notion of *finding the value of uncomputable function*, this ability being by him attributed to what he called *oracle*. To exemplify oracle's performances, one may mention such mental acts as (i) acknowledging the truth of Gödelian sentence, (ii) Turing's diagonal reasoning to define an uncomputable number, (iii) Chaitin's argument to prove existence of the uncomputable number Ω, etc. Let me abbreviate the members of opposition listed above as APSA (Algorithmic, etc) and NAPSA (Non-Algorithmic, etc), respectively.

There is an intriguing question, crucial for AI debate and for practical applications, of the role of APSA-NAPSA interactions, esp. positive fedbacks, in the course of problem-solving processes in biological, mental and social systems. A positive feedback is found, for example, in the progress of mathematics. Some intuitively perceived principles of arithmetic serve to construct algorithms, while algorithms serve further progress of mathematics. In social life there are mutual influences between spontaneous order (free market, civil society, local initiatives etc.), far from algorithmic procedures, and an established formalized order of laws, official institutions, state regulations, etc., sometimes close to algorithmic dictate. The algorithm-like social order was penetratingly treated by Max Weber who used to compare ideal judges and ideal administrators to automata having been programmed by legal instructions. In economics, an algorithmic approach was claimed, e.g., by Oskar Lange. According to that socialist economist, planned command economy consisted in an algoritmic management of economic processes – action to be performed by central planning organ equipped with powerful computers. On the other hand, it was Friedrich Hayek who stressed the enormous role of spontaneous order as involving non-algorithmic data processing (eg, that resulting in commodity prices).[3]

[3] See *Studies* volume 18 (2002), most representative of such a discourse, entitled *Free Market and Computational Complexity. Essays in Commemoration of Fredrich Hayek (1899-1992)*. The volume includes the following contributions. W. Marciszewski, *Hypercomputational vs. computational complexity. A challenge for methodology of the social sciences*; W. Banach, *Hayek: an idea of self-organization and critique of the constructivist utopia*;

Such topics in economy and politics found in *Studies* may raise eyebrows as to their conformity with the journal's purpose and scope as declared by its title. Let two points be hinted at by the way of response. First, issues of algorithmic solvability belong equally to informatics and to mathematical logic, hence any study of algorithmic vs. non-algorithmic problem-solving, as performed by social systems, belongs to applied mathematical *logic*, in accordance with the first member of our journal's title. Second, in an important phase of the development of rhetoric, namely in its Renessaince period, people used to identify rhetoric with social and political studies. The eminent historian of philosophy Stefan Swieżawski in volume 2 of his monumental work on the *History of European Philosophy in the 15th Century* writes as follows.

> «In that period, and in any case in the early Humanism, politics was identified with rhetoric, as being the basic element in those interactions among people in which crucial political decisions are made.» This is ad hoc translation (by the present author) after the original (p. 237 in volume 2) entitled *Dzieje filozofii europejskiej XV wieku*, published by Akademia Teologii Katolickiej, Warszawa [Warsaw] 1974. To support this view, Swieżawski makes the following citations.
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> «Florentine humanists and literati returned, towards the sunset of Humanism, to 'rhetorical' problems – literary, philological, linguistic – but always with a political preoccupation.» D. Cantimori, *Politics and Rhetoric in Italian Humanism, 'Journal of the Warburg Institute'* I (1937/38) pp. 83-102.
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> The second quote runs as follows. «Il primo Umanesima quattrocentesco, che la retorica, come umana conversazione, identicava con la politica.» T. Gregory, *Gli studi italiani sul pensiero del Rinascimento* [part 2], *'Rassegna di Filosofia'* II (1953) No. 1, p. 58.

A. Zalewska, *From the genealogy of mathematical economics: Walras, Pareto and Lange*; A. Malec, *Possible levels of central planning*; D. Surowik, *Leonard Savage's mathematical theory of decision*; T. Tyszka, *Remarks of the psychologist on Hayek's ideas about the role of knowledge in economic planning*; B. Borkowski and A. Orłowski, *Mathematical methods on commodity exchanges*; M. Tempczyk, *The dynamics of nonlinear systems*. Akin issues are discussed in volume 21 (2005) entitled *In search of Social Order*.

Thus our journal, being open to all issues of logic, grammar and rhetoric, at the same time enjoys an important individual niche to more convincingly justify its appearance. This niche amounts to *rhetoric approached with logical problem-solving methods, and meant as a theory of interactions within and among social, political and economic systems.* Systems are ordered sets. Hence we may employ, at least as a metaphor, Cantor's well-ordering theorem to express the fact that human societies deal with the problem of making themselves as well-ordered as possible. This nicely accords with the great liberal Edmund Burke's maxim: **Good order is the foundation of all things.**[4]

[4] Edmund Burke, 1729-1797. British statesman, orator and political thinker, championed conservatism in opposition to Revolutionary France. Counted among the greatest liberal conservatists by Friedrich Hayek. The quoted statement occurs in his work *Reflections on the Revolution in France*, 1790.