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# Tradition of the Lvov-Warsaw School *Ideas and Continuations*





## CONTENTS

<i>Anna Brożek and Jacek Jadacki, Introduction . . . . .</i>	7
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### LOGIC AND SEMIOTICS

<i>Jan Woleński, Achievements of the Warsaw Logical School . . . . .</i>	13
<i>Wojciech Buszkowski, Syntactic Categories and Types: Ajdukiewicz and Modern Categorial Grammars . . . . .</i>	35
<i>Jan Woleński, Truth-Theories in the Lvov-Warsaw School . . . . .</i>	73
<i>Anna Brożek, Questions and Cognition. On Erotetic Reasoning with Reference to some Ajdukiewicz's Ideas . . . . .</i>	93
<i>Alicja Chybińska, Kazimierz Ajdukiewicz on Semiotic Defects . . . .</i>	115

### METAPHYSICS AND ONTOLOGY

<i>Ryszard Kleszcz, Kazimierz Twardowski on Metaphysics . . . . .</i>	135
<i>Anna Brożek, Kazimierz Twardowski on Philosophy and Science . . .</i>	153
<i>Mariusz Gryganiec, On Czesław Lejewski's Ontology. . . . .</i>	177
<i>Marta Zaręba, On Tadeusz Kotarbiński's Reism and the Praxiological Theory of Action . . . . .</i>	197
<i>Aleksandra Horecka, Applying the Theory of Kazimierz Ajdukiewicz and Józef M. Bocheński to the Formulation of an Ontological Thesis. A Sketch of Non-Endurastic Semantics . . . . .</i>	215

### PSYCHOLOGY AND SOCIOLOGY

<i>Teresa Rzepa, The Humanistic Traits of Psychology at the Lvov- -Warsaw School. . . . .</i>	237
<i>Wioletta Miśkiewicz, Empirical Psychology in Lvov. Between Clandestine Laboratory and Psychology without Tools . . . . .</i>	251
<i>Piotr Surma, Bronisław Bandrowski. A Disrupted Thread in Polish Analytical Thought . . . . .</i>	265
<i>Stepan Ivanyk, Stefan Baley and the Lvov-Warsaw School . . . . .</i>	279
<i>Natalia Miklaszewska, Classification of Metnal Acts in Works of Kazimierz Ajdukiewicz . . . . .</i>	289
<i>Jacek Jadacki, Jakub Karpiński in the Orbit of the Lvov-Warsaw School. . . . .</i>	313

### CONCLUSION

<i>Jacek Jadacki, Tradition of the Lvov-Warsaw School in the Second Half of the 20th Century in Poland . . . . .</i>	333
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**Jacek Jadacki**

**TRADITION OF THE LVOV-WARSAW SCHOOL  
IN THE SECOND HALF OF THE 20<sup>TH</sup> CENTURY IN POLAND<sup>1</sup>**

**1. Logic**

*1.1. Sentential Calculus*

Sentential calculus, which had been an object of investigation under Łukasiewicz's leadership at the Warsaw school in the period of prosperity, in the following years continued to be studied mainly by logicians assembled around Słupecki and Borkowski. Outside the group were Gumański (1981), who constructed equivalence (reversible) systems, and Pietruszczak (1991), who was occupied with quantifierless calculi. Grzegorz Malinowski (1990) developed Chrisippian (two-valued), as well as non-Chrisippian (many-valued) logic initiated by Łukasiewicz, including three-valued logic. Zawirski's suggestions as to the possibility of using it in physics were taken up by Kiczuk (1995). But new ideas appeared as well.

Firstly, Łukasiewicz's questioning of Chrisippos' principle of bivalence was followed by Suszko, who rejected Frege's principle of identity of denotation of sentences with their truth-value. Thus, the next non-classical logic – after the non-Chrisippian one – came into being: namely, a non-Fregean logic, which assumes that denotations of sentences are identical to corresponding situations. Omyła (1986) systematized this new logic.

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Secondly, systems of nihilistic logic were constructed (Żabski 1995). They were founded upon a conception of truth according to which a sentence of the form “The sentence  $p$  is true” is synonymous with the very sentence  $p$ ; such systems can be used to solve some antinomies. The genesis of research on «paradoxical» logics was analogous; they allowed for a substitution of sentential variables with nonsensical (or sense-losing) expressions (Piróg-Rzepecka 1966; 1977; Piróg-Rzepecka and Morawiec 1985).

Thirdly, studies in logic which result from the weakening of classical logic by the elimination of some axioms (or rules of inference, respectively) were undertaken. Special attention, inspired by Jaśkowski (1948), was devoted to intuitionistic logic, which rejects the principle *tertium non datur* and which was already an object of Zawirski’s interest, as well as to para-consistent logic, allowing for – or rather ignoring – contradiction by removing Duns Scotus’ law from among the axioms (Paśniczek 1984; 1988).

### 1.2. Nominal Calculus

All three versions of nominal calculus considered by Twardowski’s immediate students were pursued. Słupecki (1955), Iwanicki (1965) and Kwiatkowski (1980) worked on an adequate interpretation of Aristotle’s syllogistic, Nieznański proposed for it his own axiomatization (1966) and Iwanuś (1969) discussed – in contrast to Łukasiewicz’s standpoint – the possibility of enriching it by introducing names denoting empty and full sets. In the area of functional calculus, codified by Borkowski (1958–1960), interesting results were obtained due to the generalization of the notion of quantifiers – by taking into account ramified quantifiers and by the construction of systems containing such «bifurcational» quantifiers (Krynicky, Mostowski and Szczerba 1995). Extending functional calculus (of the first order) to «fictional» (Meinongian) logic – pendant to the above mentioned enrichment of syllogistic – made by Paśniczek (1998) is even more interesting. Leśniewski’s ontology also continued to be an object of interest (Słupecki 1955; Lejewski 1958; Iwanuś 1969; 1973; Borkowski 1991). Elementary nominal calculi, close to ontology, were built by Kubiński (1971b), while Rogalski (1995) adjusted ontology to the needs of the reconstruction of medieval metaphysics.

### 1.3. Erotetics

The genesis of modern erotetics in Poland can be found in Twardowski’s incidental remarks and in Ajdukiewicz’s theory of questions developing these remarks. Their ideas were taken up and completed by Giedymin (1964), Kubiński (1971a) and Koj and Wiśniewski (1989), as well as by

Leszko (1980), who used the theory of graphs and matrices for that purpose.<sup>2</sup>

#### 1.4. *Mereology*

Attempts at completing Leśniewski's mereology have not ceased. The system of mereology was developed first of all by Sobociński (1954–1955; 1971a; 1971b). Lately, Pietruszczak (1996) has studied it intensively and Gorzka (1999) – on Tarski's inspiration – has extended it (by introducing the notion of the diameter of a region) with a view to constructing an ontology without points.

At the same time, attempts at constructing an alternative mereology have started, using the notion of founding (Rosiak 1995; 1966).

#### 1.5. *Metalogic*

Metalogical research went in two directions.

The first (meta-mathematical) direction, determined by Tarski, contained a generalization of his theory of deductive systems (Śłupecki and Bryll 1975; Rasiowa and Sikorski 1963; Rasiowa 1968) and the theory of proof (consequence), in particular (Borkowski 1970; Zygmunt 1984).

The second direction, initiated by Hosiasson-Lindenbaumowa, aimed at a satisfactory reconstruction of the logic of induction (Mortimer 1982).

#### 1.6. *Semantics*

The model-theoretical semantics initiated by Tarski turned out to be the dominant semantics in Poland. Pelc (1971) contrasted with it functional semantics – and, broadly, semiotics – as more suitable for the analysis of natural language. Starting from a similar motivation, Wybraniec-Skardowska (1985) chose categorial semantics (she constructed an original axiomatization for it), while Pogonowski (1993) declared for combinatorial semantics. Moreover, specific semantics for languages of many-valued logics were examined (Lechniak 1999).

Among particular semantic problems, the main attention was paid to the problem of empty, ambiguous and quotational subject terms as well as to self-referring expressions, probably because of their antinomiogeneity. After Kotarbiński, semantic functions of empty names were discussed by Dąmbska (1948a) and Gumański (1960) as well as by logicians interested

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<sup>2</sup> The detailed presentation of Polish logician's contribution to the theory of question is given by Brożek (2007b). She is also the author of two large monographs concerning erotetics (2007a) and the theory of imperatives (2012).

in systems that allowed empty names in their vocabulary (Iwanuś 1976; Wybraniec-Skardowska and Chuchro 1991). The problem of ambiguous names was analyzed by Kubiński (1958), by Przełęcki (1964), who extended it to the problem of undetermined expressions and interpreted in model-theoretical semantics, and by Muszyński (1988); recently, Odrowąż-Sypniewska has published a detailed monograph concerning this subject (2000). Kubiński (1965) tried to find a remedy for difficulties concerning the usage of quotational names, indicated already by Leśniewski and Tarski. Self-referring expressions were examined by Koj (1967) and Stanosz (1973).

On self-evident grounds, semantic antinomies and paradoxes, which played such an important role in the logical research carried out by Twardowski's students, also attracted a lot of interest. Among people who came back to them were: Suszko (1957b), focusing on the liar antinomy (in Łukasiewicz's formulation); Koj (1963), linking semantic antinomies with the problem of transparency; Stanosz (1965), analyzing the paradox of intensionality.

### 1.7. *Pragmatics*

Two pragmatic relations were the main object of examination: asserting and understanding. The stimulus for examining the former came from Ajdukiewicz and for examining the latter from Dąmbska.

Detailed reviews and systematizations of the problems of assertion were written by Majdański (1974) and Patryas (1987). Koj (1969) and Kmita (1971) analyzed the nature and criteria of understanding (within the framework of the theory of interpretation). A systematic survey of the conceptions of understanding was made by Jadacki (1990a).

## 2. **Ontology**

In ontology as practiced in Poland in the past fifty years, two (actually complementary) tendencies competed with one another: in the last ten years they have been emphatically articulated as Perzanowski's formal ontology program (ontologic) (1988) and as Placek's experimental ontology program (or metaphysics in general) (1995). Both programs referred to Augustynek's ontological program, the program of experimental ontology being (consciously or not) a radicalization of Augustynek's postulate requiring that an ontological system be adequate to modern physics (1970).

### 2.1. *Theory of Being or Existence*

In the domain of the theory of being, two thematic spheres dominated: the analysis of the notion of existence and the program of unifying (the picture of) reality.

It was Twardowski, Leśniewski and Ajdukiewicz who initiated, in Poland, the modern analysis of the notion of existence and non-existence. Then, the subject was taken up by Gumański (1960), who formulated it in terms of existential assumptions, Kubiński (1985a), Czarnocka (1986), who examined the nature and criteria of existence in the natural sciences, and Przełęcki (1979; 1980), who, in discussion with Jadacki (1980), focused on the ways to eliminate problems connected with sentences about non-being.

The program of unifying reality took either the form of argumentation in favor of the structural unity of the world (Tempczyk 1978; 1981) or the form of the realization of the postulate of onto-categorical reduction.

As far as reduction of ontic categories is concerned, the Lvov-Warsaw School entered into the second half of the 20th century with Kotarbiński's reism seriously impaired by Borowski's and Ajdukiewicz's criticism. This criticism was continued by Wolniewicz (1990), Przełęcki (1984) and Szaniawski (1977), who indicated the unlikeliness of a satisfactory interpretation of the distributive notion of a set in this system. However, reism also had its defenders (Czerniawski 1997). In the meantime, competitive conceptions have appeared. In those conceptions categories other than things were accepted as basic categories, namely: properties (attributivism), states of affairs/facts (situationism), events (eventism) and processes (processualism). Żabski gave a formal shape to attributivism (1988) and Leszek Nowak developed the idea of a negative ontology opposed to (positivistic) attributivism (1998–2007). Situationism was elaborated by Wolniewicz (1968a; 1985) and Omyła (1996). These attempts were accompanied by an analysis of the notion of a state of affairs covering negative (Kowalski, Krzysztofiak and Bilat 1998) and intentional (fictional) states of affairs (Pelc 1983; Paśniczek (ed.) 1991; Paśniczek 1998). The most perfect shape was given to eventism, considered by its author, Augustynek (Augustynek and Jadacki 1993), as an ontology adequate to relativistic physics. Processualism had its adherent in Tempczyk (1986).

The structural basis for these new reductive formal ontologies – and most certainly of eventism – is set theory. A quite different – namely combinatory – character was given by Perzanowski to his refined ontological systems.

## 2.2. *Theory of Necessity and Possibility*

The analysis of necessity and possibility has been carried out almost exclusively within the range of modal logic (see below).

## 2.3. *Theory of Time and Space*

Augustynek has undertaken detailed studies on time – referring to Leśniewski's and Kotarbiński's polemics, Ajdukiewicz's conception and Zawirski's and Dąbska's considerations concerning the logical status of sentences about the future. Firstly, he proposed a definition of time (1970) compatible with relativistic physics; secondly, he analyzed various properties of time (topological and symmetric, in particular) (1970; 1975); thirdly, he introduced relational notions of the past, the present and the future (1979). Snihur (1990) was his opponent regarding this last issue.

Perzanowski's analyses concerning space (within the framework of a more capacious system of locative ontology) (1993) are equal to Augustynek's analyses of time.

## 2.4. *Theory of Change and Motion*

A theory of change should resolve two difficulties: how to overcome paradoxes of motion and becoming and how to reconcile changes with the identities of changing objects. Regarding the first matter, Ajdukiewicz (1948a) proved that it is possible to describe change without infringing on the principle of non-contradiction or the principle of the excluded middle. In this matter, Placek's subtle analyses (1989; 1995) turned out to be decisive.

Regarding the second matter, Czeżowski wrote a short paper (1951b), while Augustynek gave it more attention, proposing his own definition of gen-identity (1981).

## 2.5. *Theory of Determination and Causality*

The notions of determination and causality, and determinism and causalism, respectively, so absorbing for Łukasiewicz and (later on) for Kotarbińska, were reconstructed precisely by Mazierski (1961), Augustynek (1962), Zbigniew Jordan (1963) and Trzęsicki (1989).

# 3. **Epistemology – Methodology – Praxiology**

During the last fifty years traditional epistemology has not been cultivated, in principle, in the Lvov-Warsaw School. It was Ajdukiewicz's standpoint which was decisive here: according to him, epistemological problems



could be studied only after a suitable semantic paraphrase and after such a paraphrase they became indistinguishable from respective methodological problems. However, some people saw the necessity of distinguishing epistemology from methodology (Zamiara 1974). On the other hand, methodology itself could be recognized either as a fragment of praxiology, constructed in the second half of our century, or – on the ground of some assumptions – as a fragment of a theory of behavior (Malewski 1964), or, finally, as a fragment of the theory of artificial intelligence (Lubański 1975) and the cognitive sciences (Bobryk 1988).

In the youngest generation there is a tendency to return to the traditional problems of epistemology in their original form, but with modern methods, *e.g.*, the realism-idealism controversy (Krysztofiak 1999).

### 3.1. *Programs*

In Polish philosophy of the last half century, four main (usually competing) methodological programs have functioned: apragmatical and pragmatical, on the one side, and descriptive and normative, on the other. Moreover, they have been realized either by means of semantic analysis or by means of formal reconstruction.

A clear differentiation between the first two programs – referring to the general distinction between acts and results made by Twardowski – appeared thanks to Ajdukiewicz (1948b). Thus, it was realized that (apragmatical) meta-science should be carefully separated from psychology and the sociology of cognition. The sociology of cognition – with some elements of historiosophy – became an object of greater interest only in the last phase of the twentieth-century Polish philosophy (Pietruska-Madej 1980; Jodkowski 1990; Jonkisz 1990; 1998).

In this trend they analyzed, in general, such matters as the question of continuity (paradigms) and changeability (revolutions) in science. The meta-scientific attitude was dominant. Psychologico-sociological analyses provoked, at once, serious objections from the «apragmatists» (Kałuszyńska 1994b).

Apart from apragmatical or pragmatical interest, methodologists were divided in respect to the descriptive and normative approaches. Some of them (Leszek Nowak 1971; 1973; Kmita 1976; Giedymin 1982; Sady 1990) wanted to restrict themselves to the logical reconstruction of real procedures used by scholars to obtain these results. Others (Koj 1998; Teresa Hołówka 1998) thought that their main task was formulating indications determining the methodological duties of scientists.

All of these programs were criticized by Misiek (1979).

### 3.2. Knowledge – Creative Procedures

Within both the pragmatical and apragmatical programs the knowledge-creative-procedures and their results were objects of detailed examination.

Firstly, analyses concerned observation, more generally, evidence (Rojczak 1994), and especially experience (Kalinowski 1991; Czarnocka 1992) and measurement (Kałuszyńska 1983). Measurement was subjected to penetrating considerations by Ajdukiewicz (in the final period of his life) (1961). In the School a broad understanding of empirical cognition dominated which included not only introspection, but also axiological intuition (Czeżowski 1949; 1960a; Przełęcki 1996). Problems of observation were formulated, in general, in terms of observational sentences; in such a context, the problem of the analytical components of factual sentences corresponded to the problem of theorized facts (Jodkowski 1983). It was usually connected with the problem of the status of theoretical terms (Borkowski 1966; Przełęcki 1969; 1993; Nowaczyk 1985; 1990; Kałuszyńska 1994a). Żytkow (1979) identifies those terms with sets of operational procedures.

Secondly, studies in inferential procedures (ways of reasoning), begun already by Twardowski and Łukasiewicz, were creatively continued. Polish philosophers analyzed both infallible (deductive) and fallible (inductive) inferences. Regarding infallible inferences, problems of mathematical proof (Ślupecki and Pogorzelski 1962) and its algorithmisation (Orłowska 1973; Zwinogrodzki 1976; Rasiowa, Banachowski *et al.* 1977; Marciszewski and Murawski 1995), on the one hand, and problems of verification (Czeżowski 1951a), on the other hand, were worked upon. Ajdukiewicz (1958) began the studies on the problem of the logical reconstruction of fallible inferences; Mortimer (1982) took it up in its full generality and Orłowska and Pawlak (1984) interpreted this kind of reasoning as inferences in systems with incomplete information. Other philosophers examined particular fragments of the logic of induction: the theory of inference by analogy (Dąbska 1962) and the possibility of its mechanization (Zwinogrodzki 1982); the theory of «historical» inferences (*i.e.* inferences on the basis of testimony) and the question of the reliability of informants (Giedymin 1961); finally, the theory of probabilistic (Czeżowski 1952) and statistical inferences, in light of which it appeared that the majority of the fallible methods of inference have no degree of infallibility (Szaniawski 1994). A separate study was devoted to the notion of certitude (Sady 1993).

Problems of deduction were seen, more and more commonly, as problems of justification; moreover deductive justification was opposed to deductive inference (Borkowski 1966). Analogously, induction was linked with the context of discovery, which was logically reconstructed in the spirit of the School (Zamecki 1988; Pietruska-Madej 1990; Sady 1990).

Prognostics (Woleński 1984) and explanation, as well as the notions of scientific law (Pelc, Przełęcki and Szaniawski 1957; Mazierski 1993) and hypothesis (Herbut 1978) respectively, were engaging a good deal of attention.

Thirdly, procedures of formulating problems were not neglected. The theory of questions took the shape of erotetic logic. Among particular matters, the notion of the essence of a problem was at the center of investigations.

Fourthly, mereology and set theory were used to describe procedures of partition, classification and ordering. In particular, a theory of classification was developed by Czeżowski (1950) and Batóg and Łuszczewska-Romahnowa (1965), to whom we owe its generalization.

Fifthly, Polish philosophers gave a considerable amount of thought to the verbalization and interpretation of theories. Twardowski's followers have always remembered his postulate of clarity and, even if they did not officially accept its theoretical foundation, arguing that sometimes a clear thought cannot be expressed clearly (Gorzka 1990), they have in practice struggled to observe this postulate to the highest degree. In this area, studies culminated in the analysis of definition, inaugurated in Poland in the modern manner by Leśniewski and Ajdukiewicz. Afterwards, many people were occupied with the theory of definition: Kokoszyńska-Lutmanowa (1971; 1973) (who declared for the solution which assumes only one notion of definition, contrary to Ajdukiewicz), Borkowski (1966), Gregorowicz (1962), Stonert (1959) (in deductive sciences) and Pawłowski (1978) (in humanities).

### 3.3. *Rationality*

In the domain of epistemologico-methodological problems, the main subjects of inquiry were definition, typology and criteria of rationality. Dąb-ska's pre-war research on irrationalism constituted a background for later attempts to get to grips with this question. Direct or indirect links connected her research with Grzegorzcyk (1993; 1997), who finds in rationality a distinctive feature of European civilization; with Przełęcki (1996), who enlarges the notion of rationality beyond the limits of scientific knowledge; with Marciszewski (1991), who concentrates his considerations mainly on the rationality of discussion; with Życiński (1993), who struggles to indicate the place of rationality within the compass of religion; and finally, with Grobler (1993), who analyzes especially the notion of deferred rationality.

Apart from these considerations, rationality has been approached in decision theory (Szaniawski 1994).

Finally, Kleszcz (1998) presented a review of the results of examinations in this area, distinguishing seven types of rationality (conceptual, logical, ontological, epistemological, methodological, practical and axiological); he contrasted the rationality of convictions with the rationality of acts; described the difference between rationality, on the one hand, and irrationality or non-rationality, on the other; drew up a list of criteria for rationality, introducing into it: verbal precision, application of logical laws, criticism and resolvability of entertained problems. Strawński also added simplicity to them and devoted a special study (1991) to it.

### 3.4. *The Problem of Truth*

The problem of truth has not stopped being a matter of penetrating inquiries since Twardowski presented a persuasive criticism of alethic relativism and Tarski developed the semantic (model-theoretical) version of the correspondence conception of truth. Nobody in this environment – especially after Kokoszyńska's additional explications – questioned alethic absolutism. Ajdukiewicz quickly retracted his radical conventionalism. On the other hand, Dąbbska (1962; 1975) argued that radical conventionalism did not lead to alethic relativism because conventions do not have to be arbitrary. The acceptance of moderate conventionalism (Giedymin 1982; Siemianowski 1983; 1989) could be reconciled, *a fortiori*, with the absolutist conception of truth. Let us add that, in general, skepticism in this matter was not shared (Wiśniewski 1992).

Similarly, the opinion that the correspondence conception of truth is correct, dominated. It was pointed out that both the coherentist and pragmatic conceptions were inadequate. This was done by either referring to common sense (Chwedeńczuk 1984) or to philosophical interpretations of limitation theorems (Woleński 1993). On the other hand, Grzegorzczak (1997) explicitly proved the accuracy of the correspondence conception. This does not mean, however, that the explanative power of conceptions of truth competitive in relation to the semantic conception was not tested. Thus, a «non-Fregean» version of the correspondence conception was constructed where states of affairs stated by sentences are considered to be extra-linguistic counterparts of sentences. Such a version was recognized as the most adequate interpretation of the classical (Aristotelian) solution (Borkowski 1995; Nieznański 1984; Jadacki 1990b; Biłat 1994; 1995). Tomasz Jordan's attempts (1989) tended towards a similar direction – approaching the intuitions of natural languages.

On the other hand, Grobler (1993) – not without sympathy – presented a version of the pragmatic conception, namely the dynamic (approximative) version, in which the property of being true is replaced by the relation

of being-more-closely-to-the-truth-than. Jacek Malinowski (1995) studied the illocutionary version with efficiency as an equivalent of truth. Another version of the pragmatic conception, namely the consensual version, was reconstructed lately by Kijania-Placek (2000).

Żabski (1995) build an original logic for the nihilistic conception.

### 3.5. *Praxiology*

Although the problem of distinguishing and analyzing actions (versus products) was formulated by Twardowski, it was Kotarbiński (1956a; 1966b) who was the real creator of the theory of action — *i.e.* praxiology. Afterwards, Podgórecki (1962), Pszczołowski (1969) and Ziemiński (1972a) proposed important contributions and improved syntheses.

## 4. Philosophy of Science

### 4.1. *Classification of Sciences*

Twardowski performed a penetrating analysis of the traditional classifications of sciences: the classification into *a priori* sciences and *a posteriori* sciences, in particular. The most universal inquiries into the notion of science and the classification of scientific disciplines – from various points of view – were undertaken by Kamiński (1961).

### 4.2. *Philosophy of Mathematics, Physics, Chemistry and Biology*

In the philosophy of mathematics, Batóg (1996) and Murawski (1995; 1999) were active. In particular, the question of the philosophical significance of reverse mathematics held the attention of the latter. Now, two representatives of the younger generation have joined to them; they have examined in great depth the arguments on account of mathematical realism (Bigaj 1997; Wójtowicz 1999) and intuitionism (Placek 1999).

In the philosophy of physics, the question of the philosophical interpretation of relativistic physics, brought by Zawirski was continuously an issue (Czerniawski 1993).

Lastly, the theory of chaos – and its implications for general philosophy – has become an object of study (Tempczyk 1995; 1998). At the beginning of the second half of the 20<sup>th</sup> century, Mehlberg (1951) considered the controversy between idealism and realism in modern physics; and at the end of it, Jodkowski (1996) studied the controversy between evolutionism and creationism in modern biology.



Pietruska-Madej's attention (1975) turned to the philosophy of chemistry.

#### *4.3. Philosophy of the Humanities: Psychology and Sociology, Linguistics, Jurisprudence and History*

Among philosophers from the circle of the Lvov-Warsaw School, Bobryk (1988) occupied himself with the philosophical problems of psychology.

The most serious results in the philosophy of linguistics were achieved by the program of formalizing theoretical phonology, formulated and realized by Batóg (1967; 1995) and Pogonowski (1979; 1981). As a result, a reduction of the basic phonological categories was obtained (Batóg 1967).

Relatively many philosophers worked creatively in the philosophy of law (Gregorowicz 1962; Ziemiński 1963; 1966; Nowak 1971; 1973; Woleński 1972; 1980; 1999). For instance, the status of juristic definitions (Gregorowicz 1962), modes of justifying juristic norms (Ziemiński 1972b) and the relation between juristic and ethical norms (Ziemiński 1966) were investigated. Giedymin (1961; 1964), Nowak and Kmita (1968) and Zamiara (1989) pursued the methodology of history – and, broadly, the humanities – concentrating their efforts especially on reconstructing procedures of interpretation (Kmita 1971) and also explaining the status of theoretical terms in the theory of belles-lettres (Kmita 1967).

#### *4.6. Reductions and Holism*

The problem of integrating the sciences and the chances of reductionism in this field were investigated by Strawński (1991; 1997) and Grobler (1993). Jedynak (1998) probed in detail the empiricist version of reductionism; she showed that it could not be fully realized because of the disharmony of its particular components.

Siemianowski (1988) indicated the consequences of radical empirism.

### **5. Axiology**

#### *5.1. Description, Estimation and Norm*

It was Twardowski's Lvov lectures in ethics which proved the main impulse for inquiries in axiology (or, strictly speaking, ethics) among Polish philosophers influenced by the Lvov-Warsaw School. In these lectures, the founder of the School declared himself a cognitivist and axiologist regarding the question of the relations between description, estimation and norm.

This standpoint – mainly thanks to Znamierowski (1957a), Czeżowski (1960a; 1960b) and Ossowska (1947; 1963) – has become the dominant paradigm in this context.

Ethics – as Ossowska emphatically stated – could be a science and not just a set of moral norms, if it were a science of moral phenomena, providing their scientific description and containing meta-ethics (1970) as well as psychology and sociology of morality (1963). Within the framework of the last of these, Ossowska, herself, reconstructed two examples of an ethos present in Polish society: the chivalrous ethos (1973) and the middle-class ethos (1956).

### 5.2. *Ontic Status and the Universality of Values*

In the controversy regarding the ontic status of values, Twardowski – and the other representatives of the School after him, like Tatarkiewicz – took the objectivist position: some objects are good *per se* and not because somebody considers them as good (Przełęcki 1981). Constructing a formal theory of goodness became a goal; and it was Czeżowski (1960a) who gave its outline first.

Objectivism was joined, in principle, with absolutism. At the same time, the analysis of scepticism (Dąbbska 1948b) and relativism in relation to the question of the universality of values was engaging a good deal of attention. Lazari-Pawłowska (ed.) (1975), following the slogan of the School – *clara et distincta*, contrasted axiological relativism with methodological, situational and cultural relativisms; Jacek Hołówka presented a monograph on the problem (1981).

### 5.3. *Motivation and Respecting Norms*

In the controversy regarding the sources of approval of moral norms, Twardowski and his followers were adherents of autonomism: moral norms do not need external justification, in general, and religious justification, in particular. For that reason, systems of independent ethics were developed (Kotarbiński 1956a; 1966a); they assumed the shape of atheistic Christianity (Przełęcki 1989), *i.e. hic et nunc* Catholic ethics but without theistic theses. Usually, after Tatarkiewicz, autonomism was connected with intuitionism (Czeżowski 1949). According to axiologism, that is good which is commanded; and, what is good in individual situations is – in the intuitionists' opinion – simply «visible». Thus, it is not surprising that the «organ» of moral cognition, conscience, was analyzed in detail (Górnicka-Kalinowska 1992).

Twardowski was a rigorist as to respecting moral norms. None of his followers proclaimed (or respected) such a radical rigor and some

people (Kotarbiński 1966a; Lazari-Pawłowska 1992) tended rather to a «soft» utilitarianism, presenting, in particular, its praxiological version (Pszczółowski 1982). Anyway, philosophers referring to Twardowski's program of scientific ethics, offered deep analyses of the notion of responsibility and fault (Znamierowski 1957b), liberty (Lazari-Pawłowska 1992) and justice, including just distribution of goods (Szaniawski 1994).

#### 5.4. Ethical Systems

Separating, following Twardowski and Ossowska, ethical standpoints from the science of moral phenomena – as science *ex definitione* – Polish philosophers working under the banner of the Lvov-Warsaw School tried to model their own «unscientific» ethical views into the shape of possible, rationally-constructed systems. Altruism, humanitarianism and perfectionism were stable fiducial points here.

It is necessary (according to altruism) to take care not only of our own welfare, but also – and maybe first of all (Przełęcki 1989 – of others' welfare. The dominant position was occupied by the ethics of favor towards others (Znamierowski 1957c), of good relations with others (Ossowska 1983) or at least of esteem in relation to others (Witwicki 1957). Fair life consists just of taking care of others' welfare (Kotarbiński 1966b). In connection with the altruistic attitude, semantic analyses of such notions as equality (Czeżowski 1958) and tolerance (Lazari-Pawłowska 1992) were written.

In the controversy between maximalism and minimalism the majority opinion was on the side of minimalism. Taking care of others' welfare should manifest itself, in particular, in trying to minimize the pains that others experience. This was the position of humanitarianism (Lazari-Pawłowska 1992). As far as our own good is concerned, the perfectionistic-ascetic standpoint was dominant: we ought to perfect our virtues, but the number of perfected virtues – if the enterprise is to be successful - should be radically limited, to civic virtues in particular (Ossowska 1973; 1983). Hedonism was, in principle, only an object of theoretical interest.

Tatarkiewicz (1947) wrote a splendid analysis of the notion of happiness, separating the happiness of an ethical character from vital, psychological and dispositional happiness. One of the results of this analysis was a justification of the thesis that hedonistic happiness cannot be a rational aim of human activity.

#### 5.5. Aesthetics

In aesthetics, studies were focused on the psychology of the creation and perception of art (Tatarkiewicz 1951; Wallis 1968). Pawłowski (1989)

initiated an inquiry into aesthetic values, trying also in this sphere to make use of Occam's razor.

## **6. Formalization and Axiomatization of Various Domains of Knowledge**

According to the paradigm of the Lvov-Warsaw School – at least in the version which owes its shape to Łukasiewicz and Leśniewski – the final form of philosophical disciplines should be their logical reconstruction and presentation in a shape of axiomatized formal systems. In the second half of our century, Poles constructed a few important systems of such «regional» logics, mainly of an intensional character (Jacek Malinowski 1989).

### *6.1. Natural Deduction*

As far as a fragment of methodology is concerned, such a system was presented in the interwar period by Jaśkowski as a system of natural deduction (suppositional logic). It was a realization of Łukasiewicz's postulate to reconstruct by logical means the real modes of reasoning used in mathematics. Afterwards, many philosophers worked on developing and perfecting this system: Iwanicki (1949), Śłupecki and Borkowski (1963), Suszko (1965), Nieznański (1966) and lately Dudkiewicz (1988), who concentrated his efforts on using the method of semantic matrices.

### *6.2. Deontic, Diachronic, Relevant, «Creational» and Doxastic (Epistemic) Logic*

Deontic logic was a regional logic for ethics and jurisprudence. It was developed by Kalinowski (1965; 1972; 1996), Gumański (1980; 1981), Ziemia (1969; 1983) and Świrydowicz (Ziemia and Świrydowicz 1988), and Woleński (1972).

With historical inquiries in mind, Suszko (1957a) built a system of diachronic logic.

In the domain of natural languages, Leśniewski's and Ajdukiewicz's ideas were developed; furthermore, they were put into the mature form of categorial grammars (Suszko 1958–1960; Stanosz and Nowaczyk 1976; Buszkowski 1989).

On the other hand, problems with using «normal» logic to examine natural languages – signalized by Tarski – resulted in the development of relevant logic (Tokarz 1993).

Praxiology «obtained» a «creational» logic, *i.e.* logic of action (efficiency) (Kubiński 1985b).

It was Łukasiewicz who set the framework for inquiries into the logic of convictions in Poland with his analysis of systems with functors of acceptance and rejection, written in connection with his reconstruction of Aristotle's logic. Łukasiewicz's works concerning the logic of rejection were continued by Wybraniec-Skardowska and Bryll (1969) as well as Śłupecki, Bryll and Wybraniec-Skardowska (1971–1972). Marciszewski devoted a monograph to the general theory of convictions (1972).

### 6.3. *Modal, Temporal, Transformational and Causal Logic*

Polish philosophers were also interested in the logical reconstruction of ontologico-physical problems. Various modal systems for the notions of necessity and possibility were built (Jaśkowski 1951; Żarnecka-Biały 1973; Perzanowski 1989). A review of various attitudes towards problems of modality in logic and philosophy was elaborated (Żegleń 1990). Great efforts were made to construct a temporal, «transformational» logic which could help to avoid the problem of change which threatened the principle of non-contradiction. Using Łukasiewicz's, Zawirski's, Śłupecki's and Łoś's ideas, Rogowski (1964), Kiczuk (1984; 1985) and Wajszczyk (1989; 1995) engaged in research in this domain. Wajszczyk proposed detailed systems both for dichotomous (being – non-being and *vice versa*) and continuous changes. In the case of causal logic, as in the case of modal and temporal logic, the impulse came from Łukasiewicz and Jaśkowski (1951); later philosophers from a younger generation (Kiczuk 1978; 1995) have joined them.

### 6.8. «Theological» Logic

The program of scientific philosophy, formulated by Twardowski, was later extended – by Łukasiewicz, Drewnowski, Bocheński and Salamucha – to cover also theology. The extension was undertaken against the opinions of, *e.g.*, Witwicki, who claimed that theological problems (and religion in general) belonged to an irrational sphere. Witwicki's view was endorsed by Kotarbiński (1956b), Chwedeńczuk (1997; 2000) and – it seems – by the majority of the Schools sympathizers. Nevertheless, the opposite view has never lacked defenders (Życiński 1985–1986; Bronk 1996).

The main efforts were put into the logical analysis of traditional justifications (proofs) of the basic theistic thesis of God's existence (Bocheński 1965; Nieznański 1979; 1980).

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I must stress that the above picture of the theoretical problems and results achieved by modern Polish philosophy that acknowledges its links with the Lvov-Warsaw tradition is necessarily of a sketchy character. One can hardly expect more than an introductory diagnosis, if one realizes that now, in Poland, there are *circa* one thousand active philosophers.

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