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## Andrzej Grzegorzcyk (1922-2014)

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Andrzej Grzegorzcyk died on 20<sup>th</sup> March 2014. Even though he was 91 years old, his passing was unexpected as he had been doing creative work almost until his last moment and his intellectual capacities seemed intact. His memoirs emphasized that he had been the previous century's last world-renowned representative of Polish logic. While this is true, it seems much more important that he was a very unique person, academically and socially active, but also a free spirit who chose his own path.

### I. Life

Andrzej Grzegorzcyk was born in Warsaw on 22<sup>nd</sup> August 1922, the only son of Piotr Grzegorzcyk – a Polish studies specialist stemming from an intelligentsia family from the Polish Galicia, then part of Austro-Hungary – and Zofia, a doctor born in the landowner family of Zdziarski from the vicinity of Płock. Her background was strongly leftist; her brother Mirosław Zdziarski, a known communist and a member of the Communist Party of Poland, was sentenced to death in Russia in 1937. Andrzej Grzegorzcyk spent his entire life, with only short breaks, in Warsaw. As a child, he attended a private Catholic school of the educational society “Przyszłość” (whose other fledgling was Władysław Bartoszewski) and from 1938 – the Władysław Reytan state secondary school. After the outbreak of war, when his previous school organized clandestine secondary school lessons, he decided to return there and passed his school-leaving exams in 1940, on the day of France's capitulation. To avoid being taken away to work in the German Reich, he

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enrolled at a chemical secondary school and after that, when the Germans allowed for vocational training, to a (intentionally) three-year chemical school located on the grounds of the Warsaw University of Technology, in which the university's Polish professors taught. He attended the school in the years 1942/1943 and 1943/1944, while simultaneously studying physics in clandestine classes at the University of Warsaw, taught (among others) by Czesław Białobrzęski and Leonard Sosnowski. Earlier, starting in autumn 1940, he had also started attending clandestine philosophy classes at the University of the Western Lands. He listened to lectures by Władysław Tatarkiewicz, who used to read chapters of his book *Analysis of happiness*, then in writing, to his students, Fr. Jan Salamucha (student of Stanisław Leśniewski), who taught logic, Fr. Piotr Chojnacki, the psychologist Fr. Mieczysław Dybowski and Mieczysław Milbrandt, who taught history of contemporary philosophy. He also visited lectures by Bogdan Suchodolski, Michał Walicki and others. He owed a lot to tutorials in logic by Henryk Hiż at the Philosophy Department, University of Warsaw. As he once said, "On the whole, the intellectual life of the capital's intelligentsia was very abundant, considering the reality of the occupation."<sup>2</sup> He could not, of course have ignored the reality of war: he took part in the Warsaw Uprising and escaped the Old Town through sewer channels with his colleagues from the battalion "Gustaw" (E.3 in bibliography).

He graduated after the war in Cracow, obtaining a master's title in philosophy for his thesis *Ontologia właściwości* (*Ontology of properties*), supervised by Zygmunt Zawirski, which transferred Leśniewski's ontology to a higher logical type. The ontological construction of Kotarbiński's ontological reism (propagated by Henryk Hiż) was tested by Andrzej Grzegorzcyk in various contexts.

In the years 1946-48 he worked in Warsaw as an assistant to Władysław Tatarkiewicz. He was also secretary of the journal "Przegląd Filozoficzny" edited by Tatarkiewicz. After that, he obtained a doctoral scholarship in logic and mathematics. Those were the times when "the political situation favoured staying in the safety of logical and mathematical speculations." For instance, when he submitted a paper to a philosophical conference in

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<sup>2</sup>This quotation, as all the others in this paper (except for those taken from the publication commented on in the given fragment), come from conversations with Andrzej Grzegorzcyk and his notes that he made available to me (for better coherence, I sometimes reformulate them in the third person). I am also very thankful to the wife of this article's protagonist, professor Renata Grzegorzcyk, for all her help. It should also be emphasized that a chief part of this text is taken from earlier articles about Andrzej Grzegorzcyk authored (and co-authored) by me. They are all listed in the bibliography.

Amsterdam, he, not unlike a few other Polish philosophers, did not get a passport.

In 1950, Grzegorzczak received a doctor's title at the University of Warsaw for his dissertation *Przestrzenie topologiczne w bezpunktowych algebrach topologicznych* (*Topological spaces in pointless topological algebras*) (he passed his doctoral exam on 26<sup>th</sup> May 1950). Andrzej Mostowski was his supervisor. Grzegorzczak specialised in logic, but when taking the doctoral exam in mathematics, he took chemistry as his secondary subject. After obtaining the doctorate, he started work at the Institute of Mathematics, at the Polish Academy of Sciences (PAN). There, after three years, he successfully underwent the qualifying procedure for a senior lecturer position. The grounds for the procedure was his booklet *Some Classes of Recursive Functions* (A.2). In 1961, he received the title of professor extraordinarius and in 1972 – professor ordinarius. After March 1968, for his oppositional activity, showing in “signing all open letters that got to him,” he lost his position at the University of Warsaw, where he had worked additionally for a few years, and stayed only in the Institute of Mathematics, PAN. In the 1960s, he became head of its Department of Foundations of Mathematics; the previous head, his teacher (and mine, for that matter) Andrzej Mostowski, limited himself to the chair of Foundations of Mathematics at the University. In 1973, he organised a Logical Semester in the newly opened Stefan Banach International Mathematical Centre, which brought together a few dozen well-known scholars from abroad to Warsaw. For many logicians of Poland and the countries of the block of “people's democracies”, this was a rare opportunity to meet outstanding Western logicians.

In that period, Grzegorzczak's scholarly interests shifted significantly towards philosophy. As a consequence, he moved, after gaining approval of the Academy's administration, from the Institute of Mathematics to the Institute of Philosophy and Sociology, PAN, in 1974. In this institute, after its reorganisation in 1982, he chaired the Ethics Laboratory. He “did not make attempts for any higher position.” In 1990, slightly early, he retired. After that – notably, already in the time of political freedom – he became a more active organiser in the Polish philosophical community. From 1995 to 1997 he directed a grant “Stulecie szkoły lwowsko-warszawskiej” (a “100 years' anniversary of the Lwow-Warsaw school”), which involved organising a number of meetings and lectures, including a large conference which took place in Lwow and Warsaw on the 100<sup>th</sup> anniversary of Kazimierz Twardowski's appointment to the Head of department at Lwow, as well as numerous publications (including Grzegorzczak's book A.15 in Ukrainian).

Cooperation with Ukraine and Russia was a vital part of Grzegorzczak's scholarly activity. In this respect, he seems quite peculiar as Polish scholars go: his academic ties with the East were as close as with the West. Even though he visited western countries (e.g. in 1965 he worked half a year in the Netherlands and in 1970 – a few months in Italy), he always felt better in Russia, where – as he claimed – the way of experiencing the world was similar to the Polish one.

Grzegorzczak actively participated in academic conferences all around the world. He took part in the famous conference *The theory of models* in Berkeley in 1963 and in most congresses of Logic, Methodology and Philosophy of Science, starting from the 1950s. He was an assessor in the Council of the Division of Logic, Methodology and Philosophy of Science, International Union of History and Philosophy of Science. Starting from 1995, he was head of the Editorial Council of "Przegląd Filozoficzny". From 1999 to 2003, at an advanced pension age, he was Head of the Committee of Philosophical Sciences of the Polish Academy of Sciences. From 1979, he was a member of an international philosophical organisation (Institut International de Philosophie), a fairly prestigious community, towards which he was, however, a bit critical, noting that that its activity encompasses mainly "keeping up its prestige." Until the very end of his life, Grzegorzczak was intellectually active. For example, he was on the editorial board of the bimonthly magazine "Bunt młodych duchem" ("Rebellion of the young at heart"), whose authors are mainly – as he himself admitted – the "old at body." He received two honorary doctorates: at the University of Clermont-Ferrand (2010) and the Jagiellonian University (2013).

In 1953, Andrzej Gregorzczak married Renata Majewska, who later became a professor at the Faculty of Polish Studies, University of Warsaw. They have two children and six grandchildren.

He took up logic thanks to the "radio lecture by Jan Łukasiewicz, popularizing logic, on consequence in the ancient Greek Stoic logic." He also liked geometry proofs and was fascinated by the so-called proofs for God's existence. Issues of formal logic and set theory became "a mania, an addiction, a drug" to him – something which never changed. However, he always considered them to be based on and mainly applicable to philosophical problems.

## II. Accomplishments in logic

Andrzej Grzegorzczak may be called – as he did call himself – a philosopher, logician, methodologist and ethician. He was also a writer and – in a pretty non-standard sense of the word – a social activist. His books and papers were published not only in Polish, but also in English, French, Russian, Czech and Ukrainian. His most substantial achievements – ones recognised both in Poland and worldwide – were in mathematical logic. He believed them to be inseparable from a philosophical motivation; the formal results, in turn, motivated the worldview.

### A. Computability and decidability

For Grzegorzczak, researching the computable processes, even in the form of idealised creations known as recursive functions, was as much as investigating the substantial, empirical, “palpable” aspects of the world expressed in a mathematical form.

#### 1. Recursive functions

The notion of effectiveness became better understood in the 1930s thanks to the works by Gödel, Church, Turing and Kleene, but “in the mid-20th century it was still considered mysterious.” Andrzej Grzegorzczak’s contribution to the theory of recursive functions is of historical significance. In a widely cited paper *Some Classes of Recursive Functions* (published independently as A.2), he described and examined a sequence of classes of numeric functions obtained from certain source functions (which contained addition, multiplication, exponentiation, tetration and so on) through composition, limited recursion and operation of limited minimum. Limited recursion is a scheme of creating a new function  $f$  from established functions  $g$ ,  $h$  and  $j$ :

$$f(0, x) = g(x), \quad f(n + 1, x) = h(n, x, f(n, x)), \quad f(n, x) < j(n, x);$$

limited minimum is a scheme of creating a new function  $f$  from the data of the functions  $g$  and  $h$  through:

$$f(n) = \text{the smallest number } x \text{ which is smaller than } h(n) \text{ and} \\ \text{for which } g(n, x) = 0$$

. Thus, a sub-recursive hierarchy (known as the Grzegorzczak hierarchy) is obtained – a strictly increasing infinite sequence of function classes whose sum is the important, and researched long before, class of primitive recursive functions. The third class of the hierarchy is identical to the class of elementary

functions, which may be defined as the smallest class of functions containing addition and subtraction, closed under composition, limited summation and limited multiplication. This class is also equal, as Ritchie later showed, to the class of predictably computable functions. It is created from the basic class  $F_0$  of numerical functions computable by finite automata, in an infinite number of steps: the class  $F_{n+1}$  consists of functions computable by Turing machines which use in their computations for the input  $w$  an amount of tape no bigger than  $g(w)$ , where  $g$  is a certain function in the class  $F_n$ . Grzegorzcyk's classification is thus connected with analysis of computability.

Grzegorzcyk is an author of popular lectures on computability, particularly the books A.3 and A.4. Throughout his entire academic activity, he remained faithful to the issues of decidability and computable functions. His logical research mentioned below is usually closely related to this field of study.

## 2. Computable analysis

In the 1950s, Grzegorzcyk wrote several publications examining the possibility of transferring the notion of effectiveness from the field of natural number arithmetic to the field of mathematical analysis. He offered various definitions of computable real numbers as well as methods of development of a mathematical analysis which used only such numbers and computable functions defined by such numbers (B.3, 5, 6, 8). The initiators of this field were, among others, Stefan Banach and Stanisław Mazur. The notes kept by Mazur were translated and published by Grzegorzcyk and Helena Rasiowa (*Computable Analysis*, "Rozprawy matematyczne" vol. 33/1963). However, it has turned out that the notion of effectiveness has been of little use in mathematical analysis – so far at least.

In his paper B.21 Grzegorzcyk examined computable functionals of higher types, which had been introduced a short time before by Gödel in order to prove non-contradiction of the axiomatic first-order arithmetic.

## 3. Axiomatic arithmetic

Grzegorzcyk is a co-author (with Andrzej Mostowski and Czesław Ryll-Nardzewski) of a fundamental work B.9, which introduces the research on second-order arithmetic: it is a theory formalised in first-order logic, concerning both numbers and sets of numbers. The introduction of the  $\omega$ -rule (which allows for inference of  $(\forall x)F(x)$  from the infinite number of premises  $F(0), F(1), F(2), \dots$ ) makes it possible to show that relations of the class  $\Pi_1^1$  are representable.

Grzegorzczak also wrote the book A.7, which systematically describes formalised theories of various numbers.

#### 4. Concatenation theory

His “interest in computability stems from the question, what part of the mathematics refers to the most fathomable element of the mathematical reality? Algorithmicity is no more than manipulating what is written in a way expressly given by the instructions.” In the latest period of his work, Grzegorzczak embraced research on concatenation theory (i.e. the theory of putting together two texts, or strings of symbols, into one text, where the second text becomes the continuation of the first one), proposed by Tarski in the 1920s. He obtained the following results: the simple theory of this notion, even though it appears weaker than weak arithmetic, is also undecidable (C.34, B.28, B.29) and can be substituted for both metamathematics and elementary mathematics in proofs. Instead of computability, Grzegorzczak preferred to use a “more epistemological” notion of effective *recognisability* of properties of texts or relations between texts. An “empirical” relation of concatenation of two expressions is seen as a basic operation to recognise more complex properties. Entire inferences are carried out without the intermediation of arithmetic. This complies with the approach of theoretical computer science. It is also a continuation of the experience of A.2; for instance, the arithmetic relativisation of quantifiers was replaced with relativisation to subexpressions of an expression.

The interest in decidability and undecidability is present even in his earliest publications (e.g. A.2, A.3). Grzegorzczak proved the undecidability of various theories, such as elementary topological algebra, i.e. Boolean algebra with a closure in the plane (because arithmetic can be interpreted out of it – see B.1) or other weak theories (and B.16). He also delivered examples of theories without recursive models: he was the first to show that combinator calculus (a variation of  $\lambda$ -calculus) is such a theory. He reflected upon various proofs of undecidability starting from recursively enumerable sets that were not recursive themselves (B.7).

#### B. Systems of logic

For Grzegorzczak, logic is tightly bound with general methodology and formal systems – with “epistemology and scientific ontology.” He believed that “propositional calculus is a way of using logical connectives in theoretical contexts. A philosophical meaning may be attributed to predicate logic. It

may be understood as the most general ontology (theory of being, theory of properties and relations).”

### **1. Axioms of logic**

According to Grzegorzcyk, axioms of logic should naturally express the basic properties of the logical notions which a given system contains. He distanced himself from “performance” metalogical research, whose aim is, for instance, to find the shortest axiom, however counter-intuitive it would be. For the metatheory of first-order logic, he formulated a theorem about no constants being marked by logic, which is a manifestation of the philosophical thesis about logic being topic-neutral.

### **2. Axiomatic geometry**

In his doctoral dissertation, Grzegorzcyk handled a representation of geometry in which, instead of points, there were only solid figures; points can be described indirectly since two solid figures may touch each other minimally, i.e. at only one point (B.12, B.13). The philosophical motivation of the work was to examine the possibility of describing phenomena in compliance with reism, advocated by Tadeusz Kotarbiński. This was also the motivation for several others of Grzegorzcyk’s works in methodology and semantics – including the earliest ones (B.13, C.2, C.4, C.5, C.8, C.18, C.19, C.30). The language of reism is, in his opinion, the most natural language for a fundamental, empirical description of the world. “The reistic ontological interpretation of the full propositional calculus is a simple continuation of Aristotle’s ontology.” On the other hand, Grzegorzcyk noted that restrictive reism renders the pursuit of mathematics very difficult because, for example, one cannot talk about infinite sets (C.8).

### **3. Non-classical logics**

In B.4, Grzegorzcyk showed that Leśniewski’s systems of ontology and mereology are formally equal to the Boolean algebra with the zero (corresponding to the empty set in algebra of sets) removed, which in turn is virtually equivalent to the ordinary Boolean algebra. This would mean that Leśniewski’s systems are not a meaningful contribution, which, however, does not close the discussion on their philosophical sense.

Grzegorzcyk dedicated a number of works to intuitionistic logic and its various interpretations. particularly those using topological notions, as well as the connections with modal logics (B.20, B.23, C.15, C.16). In B.20, he provided a formal interpretation of forced assertion of statements in



scientific research. It turns out that a formula is provable in the intuitionistic logic if and only if everyone, with any information given, must assert it when conducting every such research. Thus, Grzegorzczak has obtained a semantics of intuitionistic propositional calculus. His description was similar to Kripke's semantics, which was created at the same time and instantly became important and influential.

#### 4. Interpretations of logic: the defence of psychologism

In C.6, Grzegorzczak defends the ontological interpretation of the laws of logic: the laws of logic are about the world. He also delves into the history of logic; for instance, (in C.7) he follows the process of emergence of the very important notion of quantifiers, which had been used by mathematicians but became a distinct logical term as late as in the 19<sup>th</sup> century. It was the time when a psychologist interpretation of logic was dominant; it was questioned by Frege and Husserl, who said that logical relations were objective, regardless of what people perceived or thought. In the 20<sup>th</sup> century, anti-psychologism dominated logical thought. From the very beginning of his academic activity, Grzegorzczak defended psychologism understood as the belief that the relation of signification depends on the human and its description must relate to human behaviours. The description is in language and the language is someone's language, and for someone. We use logic to describe the world. Grzegorzczak tries to precisely describe the way the world can be described. This topic is present in his works starting from C.2, C.4 and C.5 up to C.27 and C.28, as well as in his book A.17, which carries the telling title *Logika – sprawa ludzka* (*Logic – a human affair*) and the paper C.29, whose title is no less telling: *Is antipsychologism still tenable?*

From this approach follows the reinterpretation of semantic antinomies. What they indicate is not so much the contradiction of language as the limitations of the notions we have created. For instance, Grelling's antinomy can be understood as the foundation of a proof of the statement that a certain correctly defined set of expressions cannot be precisely named. Similarly, the liar antinomy allows us to prove that there exists a correctly worded problem on which no methodologically educated person can think in a non-contradictory, honest and fully aware (i.e. with an awareness of the sentences he does and does not assert) manner.

Andrzej Grzegorzczak takes a distinguished place in the history of mathematical logic. He lends his name to the mentioned hierarchy of primitive recursive functions. Another sign of his influence is the fact that, in B.20 and B.23, he handled the modal logic connected to the pattern

$\Box(\Box(A \Rightarrow \Box A) \Rightarrow A) \Rightarrow A$ , whose addition to the system S4 creates a system which George Boolos, in his monograph *The unprovability of consistency*, called the system S4Grz – from Grzegorzcyk’s name. His work with Andrzej Mostowski and Czesław Ryll-Nardzewski remains the starting point of the research on axiomatic second-order arithmetic and arithmetic with an infinite inference rule.

His logic textbook, reprinted multiple times (A.6 in the Polish version, A.8 in English), played a substantial role in the field. His book A.4 on recursive functions was published in French upon request of the publisher and was used in France as a textbook. Grzegorzcyk was the first one to popularise logical calculus and the issues of decidability in Poland, in his books A.1 and A.3. The first of these was also published in Czech and Russian.

A sign of the recognition he had as a logician is the fact that after the death of the famous Dutch logician Evert W. Beth, it was Andrzej Grzegorzcyk who was asked to become his successor in Amsterdam. Grzegorzcyk went there – as it later turned out – only for a few months, as he was not able to settle there. As he explained, he was too attached to Warsaw.

Andrzej Grzegorzcyk was a tall man, slim, thin even, with sharp features. His untidy hair and lack of concern with clothing well fitted the stereotypical image of a philosopher or scholar. Notably, he did not care about the impression he made or whether somebody would like him or not; all he was concerned about was the truth. This is why he easily entered relations of distance, often at the discomfort to others, though he never sought conflict. One of the reasons was his “logicality”: he preferred things to be said directly, without understatements; he was at odds with allusions or subtle associations. Hence, he always stayed on the margin, even though he was both academically and socially active; he mingled with mathematicians, philosophers, Catholic intellectuals, artists as well as international political and social activists supporting the idea of non-violence.

Andrzej Grzegorzcyk always worked in a highly independent manner and, though respected for his knowledge and acute mind, he avoided entering the sort of cooperation that would enable the emergence of a school or at least of his students. It is hard to say whether he had any students or continuators in the narrow sense. This was, to an extent, an effect of his personality traits as well as his high demands with respect to the ability of formal reasoning. As he auto-ironically claimed: “I scared people off.” He rarely did research together with others, although he cooperated with various people – in the beginning, mostly with his teacher Andrzej Mostowski

(B.9, B.11 and the review work *The present state of investigations on the foundations of mathematics*, i.e. “Rozprawy matematyczne” vol. 9/1955, written by Mostowski and six of his students) and quite recently, in 2004, with his younger colleagues in a seminar on concatenation theory run together with Andrzej Salwicki and Marian Srebrny at the Institute of Mathematics, University of Warsaw. Being an employee of the Polish Academy of Sciences throughout his career, Grzegorzczak spent little time teaching regular student classes. He was the supervisor of two doctoral dissertations: in logic in 1975 (Stanisław Krajewski, *Niestandardowe klasy spełniania i ich zastosowania do badania niektórych rozszerzeń teorii aksjomatycznych (Non-standard satisfaction classes and their applications for the research on some expansions of axiomatic theories)*) and in ethics in 1992 (Bohdan Misiuna, *Analiza filozoficzna zjawiska oburzenia i jej konsekwencje aksjologiczne (Philosophical analysis of the phenomenon of indignation and its axiological consequences)*). I must add that I myself, despite having quite a tight bond and always regarding him as a reference point, do not feel his student in any distinct sense.

### III. Views: logic and anthropology, ethics and religion

Andrzej Grzegorzczak is logic incarnate, more so even than most of the great logicians. According to him, regardless of the motivation for our reflections, logic is the criterion of their value: whether the reasoning is logical, systematic and self-aware.

Grzegorzczak’s fundamental approach to philosophy is largely a continuation of his youthful discovery of logic, suggesting that “everything in this world can be justified in a precise and certain manner.” He surely began to take this statement less seriously later, but the firm belief remained that everything can, and should, be formulated in a logical and precise way. Apart from the logical topics, Grzegorzczak took up issues of ethics and philosophical anthropology, always with a distinct methodological self-awareness, within the philosophy he called “rationalism open to values.” Logic is supposed to help overcome particularisms. Hence, as he wrote, “a worldview requires logical culture and analytical philosophical insight.” He was concerned about this in his work, whether he handled development of the formal construction of the Universal Syntax or examined the human condition – the essence of humanity, the ability to create new notions, theories, classifications, that is, the “megatools of the mind.”

I think that Andrzej Grzegorzczak may be regarded as a prototypical logician. I must note here, however, that this is not only meant as praise. Surely, we all have heard people whose near ones were logicians talk – with resignation or even disgust – about their rigidity, insensitivity to the ephemeral, not noticing fuzzy notions, impractical attitude to the world. What is more, many philosophers see the role of logic differently from Grzegorzczak's views. For example, he says: "We might add an evaluation system to the system of world description, but the evaluations must be clearly distinguished, indicated and ordered, so that no one feels cheated. Only formal logic can secure the language from this threat." This is a radical opinion, unacceptable to the greater part of contemporary philosophers. They considered an approach like this to be the source of threats itself because each language must be embedded in Husserl's "Lifeworld"; moreover, a total domination of Pascal's *esprit de géométrie* over *esprit de finesse* poses the threat of missing the reality. All the more so, one might add, that on his reflection upon the need for logic Grzegorzczak added a peculiar thought: he was inclined to believe that a worldwide enforcement of it should be necessary. This thread could be called platonic; it shows why a person invited to symposia and discussions, valued for his erudition and ability to conduct a wide-ranged reasoning in a non-emotional way, hardly anyone identified with him.

## 1. Views in the form of a philosophical system

Several issues were taken up by Grzegorzczak time and time again, with hope to develop a better, more precise approach. These were mainly issues of ethics and philosophical anthropology, always handled with a distinct methodological self-awareness. The Author himself distinguished the following fields among them: epistemology and ontology, human condition, general human axiology. He found them to be mutually connected. In A.14, he called reflection upon them "rationalism open to values."

As far as epistemology and ontology are concerned (A.13–A.17), Grzegorzczak believed that the structure of the world may be contained in a certain recognised formal structure of notions. The motivation is, to an extent, practical: "a formal system at the foundation of a worldview seems indispensable nowadays due to the linguistic diversity of humankind and the necessity to communicate in an increasingly precise way, the need for unambiguous, objective communication separated from emotions in the increasingly complex matters of coexistence. Logic at the foundation of ontology and metaphysics may ensure freedom from biased or emotionally

marked notions, which from the very beginning contain some selfish pressure and which are easily born in regional or national cultures, where group interest distorts the objectivism of thought.”

A.17, besides the issues that were further handled in his other books (particularly A.18 and A.19), contains a formal construction of the Universal Syntax, kept in Tarski’s style, which leads to the following statement:

To say that a sentence A is true is equivalent (within our system) to asserting the sentence A (relativised to the field for which A is being applied).

This may be called a “trivialisation of the notion of truth,” though – as the Author emphasised – “the proof for this trivialisation is not trivial” (A.17: 147). While reflecting upon the liar paradox, which lays the foundation for the aforementioned construction, Grzegorzczak transformed the antinomy into a statement about the human, or rather the human condition: as said before, this makes it possible to prove that there is a problem about which a human cannot think in a non-contradictory, honest and conscious way. The anti-psychologist interpretation of meaning is inspired, the Author wrote, by an idealistic vision of the world (C.29: 109).

Human condition is a topic researched and examined by the broadly defined philosophical anthropology. The issues handled in the book *Psychiczna osobliwość człowieka* (*Mental peculiarity of the human*) (A.19) were earlier discussed in A.10, A.12, A.14 and – to some extent – even as early as in A.5 and A.9. The fundamental problem is to detect what constitutes the essence of humanity, what distinguishes the human from other creations. “Such a representation itself is philosophical in its nature although it refers to the knowledge of natural science. However, the natural sciences rarely afford a perspective that is general enough”

The human condition is free existence, even though it is limited by various factors. The human as an “animal” has specific features: it constantly enriches the standards for the quality of life (A.19: 34) and, to a large extent, creates its own habitat (A.19: 37). The individual nature of human, however, is only visible to an approach that goes beyond biology. In principle, the human is distinguished by sensitivity to values and the spiritual sphere, but the more perceptible part is the ability to use language and symbolic thinking, thanks to which an individual can gain control over their emotions. Humans recognise the dimension of sanctity and transcendence. They are also capable of creativity, which gave rise to a civilisation far superior to the “civilisations” of other animals. The most important part, however,

is our ability to create new mental tools such as new notions, theories, classifications etc. The systems of thoughts are the “megatools of the mind” (A.19: 104).

Grzegorzczak approached even the formal issues from a philosophical point of view, “combined with the will to simplify the entire vision and the desire to reveal the humanistic (axiological) overtone of the problem’s solution.” It is visible, for example, in the analysis of antinomy in A.17. The conclusions of the antinomy concern the intellectual condition of human. What is more, “his entire interest in computability is also humanistic and concerns the human condition. This is a field of thought where there is unwavering certainty. Distinguishing the domain of effectiveness (computability) shows a limitation to our intellectual capacities, that is, a limitation to our cognition. The truly certain and obvious is the very tangibly provable.”

With regard to methodological reflection, Grzegorzczak believed that “the way of arriving at the certainty of knowledge is in itself a crucial part of experiencing the value of the gained knowledge. The only way to experience the deeper truths is through linguistic formulas built in compliance with the rules of a language code. Divine knowledge, direct and transcending language, is unavailable and unimaginable to us.”

## **2. Ethics**

Apart from reason, the human is characterised by ethics. “A mind purged from egoism and subjected to the discipline of logic (both these things may be very difficult to attain)” should reveal “elements of universal human axiology.” Their appearance in the experience of an individual, though, often requires a deeper ethical shock, one’s own experience or an encounter with someone’s powerful testimony. Grzegorzczak added that “it is quite striking how most people worshipped as saints in the Christian religion are former sinners who went through the stage, or ‘cultural device’, of metanoia, a great internal conversion, some kind of a fundamental ‘turn’ in their personal code of conduct. At some point, attempts were made to transfer the device of metanoia to the newly created lay culture of the communist society but, as it seems, without any deeper results.”

Formal logic research, however fascinating, remains “child’s play” when compared to the real problems humanity is struggling with. Grzegorzczak expressed this belief in dramatic manner: “Sometimes, when looking at the power of the mathematical minds concentrated around abstract problems, I was under the impression that there was some satanic power at work there,

causing the most talented people to be paid for work without meaning for the good of the people. Not one of them works towards the deletion of the real source of human misery. Scientists great and small are employed in an intellectual circus lest they as much as try to think about what is really worth accomplishing in this world.” Hence, the “mathematical ‘play’ – which is quite well-paid, incidentally – may be considered a waste of energy that should instead be used to devise real actions with a distinctly good purpose.” Therefore, detached intellectuals should start feeling guilty and a desire for a more dedicated contribution to solving the socially important problems of the country of the world.

Humans “create their own mental tools which let them exceed their earlier standards. It is not enough anymore to feel and suggestively express these humanistic intuitions, as, for instance, the phenomenologists did. A philosopher nowadays must present a clear and consistent system of notions.” Grzegorzczak added: “natural scientists present a worldview that is cognitively sloppy, although they gain great authority with respect to general philosophical views because of their scientific authority and referring to certain scientific research. However, they spread imprecise ways of thinking in the process. Of course, most philosophers also contribute to spreading the lack of precision in thinking because they skip the rules of building a logical reasoning for better effect or unconsciously neglect them.”

In his social activity as a philosopher, Grzegorzczak was interested in the ethical attitude and method of conflict resolution known as non-violence, whose widely known propagators were Mahatma Gandhi and Martin Luther King (e.g. D.9, D.49). He co-organised visits of well-known activists Jean and Hildegard Goss in Poland and in 1991, he provided substantial help with the organisation of a symposium in Moscow with the participation of the Goss’s as well as leaders of the movement such as Jean Vanier from France or Gene Sharp from the USA. Grzegorzczak was a radical: keeping the non-violence ideal, he supported dialogue with everyone, including – as it logically follows – terrorists.

Readiness to coerce others to logic and to dialogue with literally everyone are not the only examples of Grzegorzczak’s radicalism of thought. An even more interesting statement of his was that it is harmful to strive to defend one’s dignity, “what is one’s own, including beliefs and good opinion” (F.2) in every situation, as the right thing to do is to turn the other cheek.

### 3. Religion

Grzegorzczak combined reistic inspirations with his own sort of naturalism with a convinced religious participation. He was always interested in religion, particularly its moral dimension. He wrote about it from a Christian perspective. He handled religious issues in a literary form in his book of short stories and essays *Moralitety (Morality plays)* (A.11). As the title suggests, it is always morality that is the crucial problem to the Author. In the book's "pseudostories", "pseudosermons" and "pseudotreatises", he wrote about Prometheus and about Arjuna, but mainly focuses on the Christian motives that may be seen as a radical commandment of "testimony of selfless care," also towards the opponent. The radicalism he preaches is uncompromised: "And it is not being destroyed that is important, but not allowing for the internal diminishment of one's own intentions."

Grzegorzczak approaches Christianity in a more systematic way in his book *Europa – odkrywanie sensu istnienia (Europe – discovering the meaning of existence)* (A.18), in which he also indicates the role of logical thinking as the foundation of the achievements of civilisation. The book is an attempt at an "axiological look at history." According to the author, "the Revelation, that is a certain special divine intervention in the development of human cultures, was adjusted to the evolutionary development of the *homo sapiens*." He advocated the value of such attitudes as altruism and serving. Europe had seen the creation of logically ordered scientific theories. They are founded, according to the author, in the "deductive logic, rules of empiricism and a search of the essence of phenomena" (A.18: 50). Grzegorzczak regarded the meaningfulness of the world as the way of seeing the world like a "text that can be understood." Everything is potentially comprehensible. The history of religion is the pursuit of meaning. Abraham is the beginning of a new era of monotheism. Of course, biblical thinking is metaphorical. A more philosophical version is obtained by a combination with the Greco-Roman European intellectualism. Jesus calls to a consistent individual testimony, while passing over the problems of normal life and handling "almost exclusively extreme situations" (A.19: 152). Christianity calls to "fulfilling the spiritual values, not vital ones" (A.19: 159). Grzegorzczak read Christ's words "let your word 'yes' be 'yes,' and your 'no' be 'no'" as "a kind of approval for the European logic" (A.19: 191). It is quite clear that such an approach may be easily criticised. However, the author strived not to approach the issues in a naive manner, noting that the intermediaries of the Revelation were using notions appropriate to their time and place. I



shall add that one should remember metaphors are used not only in religion, but also in sciences.

In Grzegorzczak's regard, logic in a broad understanding was a pillar of European rationalism, with which he identified (A.18). According to this rationalism, knowledge must be logically and empirically consolidated and reach what is substantial. He said a number of times that only the statements which are intersubjectively communicable and provable should be accepted, a belief he shared with Kazimierz Ajdukiewicz. Grzegorzczak was a religious person, which, of course, led to the problem of agreement between faith and logic. He basically adopted two solutions: the way of ethics and the acceptance of what cannot be expressed by words. First of all, he emphasised ethics and its universality. In the introduction to his analysis of the Decalogue (D.3), Grzegorzczak emphasised that "the commandments of religion contain the same intuitions that are a part of all human instincts."

The other way of overcoming the conflict of reason and religion was to accept – in spite of the radical, narrowly understood rationalism – the entire realm of what is impossible to express. This can be best illustrated by fragments of his poem from 1974 (E.1):

I do not contradict those who say You are not.  
I agree with my friends who say the notion of You is contradictory.  
[...]  
only the one has a pure idea of God who does not have it at all.  
[...]  
the one has You to whom even the idea of You is strange  
and who lives a hope  
that [...]  
there is something that will remain.

Rational theology is not appreciated under such an approach. Religious worship is a fundamental thing, by which he meant mostly, but not exclusively, Christianity and within Christianity not only Catholicism, in which he was raised, but also Orthodoxy. The biblical tradition was important to Grzegorzczak but the most important thing is the moral testimony of Jesus. Humanity is constituted by both reason and openness to values.

#### **4. Social situation**

According to Grzegorzczak, an axiological understanding of human history is "the greatest intellectual challenge" we should feel nowadays. "Particularly

from a religious point of view, axiological experiences are the foundation of human condition enforced on us by the Creator. People are trying to get away from the axiological exam of life in this world and, instead of justice, strive for skill, mainly in the self-centred pursuit of riches. This, however, is an ostrich policy. God shows us repeatedly that it is justice we are being asked for, but the activity of God is limited to the relentless offering of options. Humans remain free and hardly ever choose the best way, except for some moments of heroic decisions that, when made, change the shape of the world – though just for a moment, until the next trial. Nothing important happens automatically, the good cannot be programmed. It has to be constantly created with a new effort.”

Grzegorzcyk understood long ago what has only recently become obvious to all commentators. Our times are witnessing the growth of “a great civilisational conflict. The wealth of some (privileged classes that exist in all countries of the world) is driving an increasing contrast to the poverty of the rest, who throughout world have become marginalised, excluded from the system, which revolves around the things important mainly for the rich, powerful and clever. Intellectual divisions perpetuate the conflicts. Understanding or agreement on a global scale requires a common language, one common look at the entirety of human affairs. Without a common language of notions, world peace seems impossible.” The agreement of notions in question should be carried out in the following way: because of the increasing data flow, decision making requires appropriate justifications, which in turn require a suitable theoretical system. One cannot fulfil the desires of everyone so we have to bear the limitations in solidarity; global regulations have to be introduced and this requires convincing argumentation. Moreover, we need a synthesis of scientific knowledge, which also should “serve the just and peaceful coexistence of people.”

Earlier than almost everyone under communist rule in our part of Europe, Grzegorzcyk understood that the problems our civilisation is facing are global and that they therefore require worldwide cooperation. He made an appeal to the UN, suggesting the introduction of a rule declaring a new fundamental human right: “every person has the right to help any other person in a worse position than himself or herself in whatever country that person may reside.” Solidarity of all humans is a fundamental message of Andrzej Grzegorzcyk’s writings. Moved by a report by the Club of Rome, he was one of the first people in Poland to advocate limiting consumption and combating waste, an idea that sounded abstract, if not absurd, in Poland forty years ago.

It is much harder to evaluate his work in ethics, anthropology etc. than his accomplishments in mathematical logic and related fields. Grzegorzcyk reasoned on his own, with few references to literature (the bibliographies in his papers and books were very limited) and did not contribute to cycles of works created by the specialist circles in universities. For instance, he does not refer to the classic author in philosophical anthropology and theory of values, Max Scheler. Therefore, it might not come as a big surprise that no reviews of his books were published. It may be expected that they will have a limited reach and influence. One of the reasons for that may not be their content but the specific attitude of Andrzej Grzegorzcyk. As he utterly ignored all sorts of political and social connections, no circle fully treated him as “one of them”. This attitude, focusing exclusively on the reflection on notions – including values – regardless of their sources and context, may have been regarded as obliviousness to the reality, or at least to its parts that were vital for others. For example, Grzegorzcyk criticised the “Solidarność” movement at the time when Poland was divided into its supporters and opponents, with little place for a middle option. Even the environment of the Catholic individuals around the weekly magazine “Tygodnik Powszechny” broke cooperation with him at one point. I must add that I myself was frequently shocked by his insensitivity to matters important to me, like the wound left by the Holocaust. However, no one ever accused him of dishonesty.

When evaluating Grzegorzcyk’s attitude, one might want to note a letter published in the “New York Review of Books” on the 4<sup>th</sup> August 1977, regarding the mentioned appeal to the UN. In the letter, Grzegorzcyk was introduced by Noam Chomsky (the controversial character of his later views is of no importance here) as a “logician and philosopher, a man of great scholarly distinction and courage, whose views have been suppressed in Poland.”

Although his non-logical publications generally remained unnoticed, there are exceptions: in 1987, he was awarded a literary prize for his book *Moralitet*. Another exception is his “Decalogue of reason” (D.42), which is still being referred to in discussions about how one should argue in a responsible way. It is worth citing here: 1. You shall not clap. 2. You shall not catcall. 3. Listen to the content, not the tone. 4. Fight an argument not a person. 5. Do not flatter another or yourself. 6. Do not blindly believe another or yourself. 7. Seek the essential. 8. Try to build something better, do not look for scapegoats. 9. Do not generalise too readily. 10. Do not use proverbs, as they are usually the folly of nations.

Grzegorzcyk himself followed these rules quite strictly, more than an average philosopher. This meant, among other things “never to care about praise from the audience.” He believed that by using only substantive criteria, avoiding patterns we “might deprive our life of the appeal of a boxing ring but will contribute to the better understanding between people.” Understanding of people, solidarity of all humans, logic, precision of notions – these are the messages he left us. Simple but always up to date.

## Publications by Andrzej Grzegorzcyk

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  - 1b. *Популярная логика* (in Russian), Moskva 1965.
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8. *An Outline of Mathematical Logic*, Reidel-Holland 1974, 596 p. (English translation of a revised text of A.6).
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11. *Moralitety*, PAX, Warszawa 1986, 176 p.
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17. *Logic – a Human Affair*, Scholar, Warszawa 1997, 147 p.
18. *Europa – odkrywanie sensu istnienia*, Fundacja Akademii Teologii Katolickiej dla Wspierania Rozwoju Chrześcijańskich Nauk Społecznych i Społecznej Gospodarki Rynkowej, Warszawa 2001, 250 p.
19. *Psychiczna osobliwość człowieka*, Scholar, Warszawa 2003, 174 p.

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2. (with Kazimierz Kuratowski) “On Janiszewski’s property of topological spaces,” *Annales de la Societe Polonaise de Mathematique* 25/1952, 69–82.
3. “Elementary definable analysis,” *Fundamenta Mathematicae* 41/1954, 311–338.
4. “The systems of Leśniewski in relation to contemporary logical research,” *Studia Logica* 3/1955, 77–97.
5. “Computable functionals,” *Fundamenta Mathematicae* 42/1955, 168–202.
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