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Some Introductory Thoughts on Contemporary Polish Ontology

This book is a collection of articles authored by Polish ontologists living and working in the early part of the 21st century. Harking back to the well-known Polish Lvov-Warsaw School, founded by Kazimierz Twardowski,[1] we try to make our ontological considerations as systematically rigorous and clear as possible – i.e. to the greatest extent feasible, but also no more than the subject under consideration itself allows for. Hence, the papers presented here do not seek to steer clear of methods of inquiry typical of either the formal or the natural sciences: on the contrary, they use such methods wherever possible. At the same time, I would like to draw attention to the fact that despite their adherence to rigorous methods, the Polish ontologists included here do not avoid traditional ontological issues, being inspired as they most certainly are by the great masters of Western philosophy – from Plato and Aristotle, through St. Thomas and Leibniz, to Husserl, to name arguably just the most important.

The subject of the present volume is no single ontological issue, in that its purpose is to demonstrate the richness of ontology as currently practised in Poland. The articles contained here touch upon and range across the most important ontological issues: substance and dispositions, persons and knowledge, as well as language, time and mathematical objects – not to mention the ontology of action and the metaphysics of possible worlds. During the very first meeting of the Polish Philosophical Society in Lvov in 1904, Kazimierz Twardowski spoke the following words: "The one and only dogma of the Society will be the conviction that dogmatism is the greatest enemy of scientific work. Just as all radii of a circle, though originating from different points around its circumference, combine and meet in its center, so we wish all directions taken by the work and philosophical views of our Society to aim at just one goal: the illumination of the truth" (Twardowski, 1904, p. 241, trans. C. Humphries). The philosophical metaphor of a circle, in which various methods and issues, striving for true cognition, converge in the middle, fits well with the current book: the reader will encounter ontological analyses here

1 For a general overview, see Woleński (2015).

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that employ a wide range of methods, but which nevertheless all focus on seeking out ontological insights of the most perspicuously truthful kind.

Ontology in Poland, as in other countries, is diverse and heterogeneous – and it is surely good that it is so! This collection of articles brings together the work of ontologists who, in their deliberations, mostly make use of methods specific to either the formal sciences (mathematics and logic) or the natural ones (physics). Ontology of this kind, while approximating to a form of scientific inquiry, remains most definitely a philosophical discipline: it does not become just another part of science (even in the broadest sense of that term), but rather just uses scientific tools. This type of ontological approach is not the only one present in Poland, but it is one that in one way or another continues the tradition initiated by Kazimierz Twardowski, Stanisław Leśniewski, Roman Ingarden, Kazimierz Ajdukiewicz and Józef Maria Bocheński – one still enthusiastically continued in the opening decades of the 21st century by Bogusław Wolniewicz and Jerzy Perzanowski. We ourselves, while seeking to take this tradition still further in Poland, also form part of the increasingly popular direction known as "mathematical" philosophy (sometimes also referred to as "logical" or "formal" philosophy), which may be regarded as the sister of "analytical" philosophy in the strict sense of that term.

I shall now turn to the content of the articles that compose this volume. In Tomasz Bigaj's opening contribution, entitled "On Essential Structures and Symmetries", the author addresses a classic issue: do physical objects exist in isolation? That is to say, are they independent, or do they need larger wholes in order to exist, within which they must coexist in relations obtaining between them and other objects? Structuralists claim that structures are ontologically primary as beings, and it is only within such structures that individual objects can be identified and studied. Nevertheless, the question naturally arises of whether the objects that find themselves transformed within some given structure lose their identity after being transformed by it, or remain the same. Bigaj defends a version of structuralism in which the identification of individual objects in different possible worlds (that is, after the changes in question have taken place) is carried out by means of qualitative relational structures, which he calls "essential structures", thus defining his position as "essential structuralism". This solution allows for the identification of objects regardless of the fact of their being transformed across possible worlds.

In physics, the concept of symmetry plays a special role, because it is believed that what distinguishes real physical reality from that which is theory-dependent is precisely that which remains invariant across all variation at the level of physical theory itself. Bigaj discusses the concept of identity or sameness in relational structures in detail, pointing out that a standard model-theoretic approach to symmetry fails to meet the expectations of structuralists. He proposes a new concept of symmetry, fully compatible with structuralism, in which qualitative properties

of objects (e.g., electron mass) are used to identify objects. Then he juxtaposes his own approach to symmetry with the standard symmetries that occur in physical theories to show how his new conception of it works. He considers discrete symmetries, such as permutations of quantum-mechanical states of multiple particles of the same type (e.g., electrons or photons), as well as continuous symmetries that include Leibniz shifts and Galilean boosts.

The next article touches upon the ontology of persons and, in particular, the problem of identity – the topic previously analysed in a slightly different context and with different methods by Bigaj. Mariusz Grygianiec, in his contribution "Prospects for an Animalistically Oriented Simple View", notes that the following two positions are treated as mutually incompatible: (1) that human beings are biological organisms (i.e. that every person is identical with a certain organism), and (2) that there are no non-circular criteria for personal identity such as would constitute necessary and sufficient conditions for personal identity. Such criteria can only ever be trivial, circular or uninformative. These views are contrasted in the literature, with the former called "animalism", the latter the "Simple View". In his text, Grygianiec offers three potential strategies for reconciling these seemingly contradictory positions.

Grygianiec presents the two positions in detail. He discusses the criteria and conditions of identity they involve, giving examples of such criteria, including the axiom of extensionality for sets and Davidson's criterion for the identity of events. He then presents three strategies for combining animalism and the Simple View. The first refrains from treating "human animal" as a natural-kind term, and consequently also from construing "human being" as such a term, where this results in there being no metaphysical criteria for the identity of persons. The second treats the terms "human animal" and "person" as both natural-kind terms, but rejects the possibility of formulating criteria for personal identity. The third strategy, preferred by Grygianiec, adopts an animalist stance while at the same time excluding the possibility of formulating criteria of identity for persons, in that the term "person" is open-ended and not a categorically well-defined concept, while also not being a natural-kind term – so that metaphysical criteria of identity cannot be associated with it. In this way Grygianiec reconciles animalism and the Simple View.

One of the properties of real objects is that they exist in time. However, what exactly does this mean, and what are its consequences for real existence? The real object is, one might say, somehow doomed to reside in one present. Its present being is always to be found between its past and its future. It cannot remain in its present – it must, so to speak, trail away into the past. Roman Ingarden characterized this suspension between past and future as a fissure-like existence. To some extent, this mode of existence can be overcome by human beings through conscious living.

They can go beyond the present moment: for example, by recalling the past or looking to the future with hope. Thanks to this, they are able to reduce the fragility of their existence. But can the limits of the present be extended infinitely in both directions, so as to cover both past and future? An object existing in this way would resemble an absolute being. These fundamental problems are taken up by Filip Kobiela in his contribution, entitled "How Long Does the Present Last? The Problem of Fissuration in Roman Ingarden's Ontology". Kobiela harks back to the tradition established by Ingarden, which has enjoyed a rich existence in Poland itself but remains insufficiently well-known elsewhere. He recalls the analyses of time put forward by St. Augustine, Bergson and Popper. He also skilfully quotes the analyses of two other Polish thinkers, the philosopher Bogdan Ogrodnik and the well-known writer Stanisław Lem.

As a result of their deliberations, ontologists often affirm certain claims. Roman Ingarden, to advert to him once again, asserted that if an object changes its way of existence, it must lose its identity, because it is not possible to change its way of existence and preserve its identity as an object. An epistemologist listening to such considerations will immediately be prompted to ask of the ontologist various questions. How did you come to know that? On what basis do you claim it? How can you attain such knowledge at all? Could you have allowed yourself to be mistaken in your deliberations and arrive at a false conclusion? From the very dawn of philosophy there has been a dispute over the relative priority of ontology and epistemology. "The Subject's Forms of Knowledge and the Question of Being", a joint contribution by Zbigniew Król and Józef Lubacz, concerns the ways in which a subject can acquire knowledge – especially ontological knowledge.

Contrary to popular philosophical trends, Król and Lubacz seek to show that hidden assumptions, non-act-like components of cognition, and – something that rarely appears in epistemological reflections – trust play an important role in the acquisition of knowledge. Definitions of knowledge often rest on the conviction that to know something is to be in possession of a justified true belief. One of the conclusions presented by the authors is the opposite statement: it is possible that a subject can genuinely know something that is false.

Another contribution dealing with the struggle for the primacy of ontology over epistemology is Andrzej Biłat's text, entitled "The World as an Object of Formal Philosophy". Biłat adopts and defends an ontological paradigm of philosophy. The starting point for philosophy, according to the latter, is the question "What exists?", which differs from the Cartesian paradigm (represented here by the article of Król and Lubacz just discussed), for which the very first question is "What can I know?". Biłat, inspired by the intuitions of Plato and Aristotle, presents a formal analysis of concepts basic to the ontological paradigm of philosophy: namely, the concept of the world as an extensional whole (i.e. a non-empty class including all classes

of beings), the concept of the real world (i.e. the non-empty class of all temporal beings), and that of the world of nature (a concretum occupying the entirety of space at any given time). After giving a precise definition of these concepts, he outlines the position of extensional metaphysical realism, seeking to show that this position is entailed as a metaphysical consequence of contemporary logic (to be precise, monadic second-order logic) and the methodology of the natural sciences (including cosmology).

Biłat's contribution is a good example of a formal approach inspired by the thoughts of the great classics of philosophy: Plato, Aristotle and others. The approach in question is one that seeks to address issues central to philosophy in ways that make use of modern developments in the formal and the empirical sciences, including logic, mathematics and physics. From the perspective of such an approach, formal philosophy – the term "logical philosophy", as propagated by Jerzy Perzanowski, is also widely used in Poland to refer to this – is not only a certain method to be encountered in contemporary philosophy, but also something that has been an important component of philosophical thinking from the very beginnings of philosophy. Formal ("logical") philosophy in Poland is not detached from the Western tradition of philosophy, and its inspirations reach right back to ancient philosophy, as Biłat demonstrates – as well as taking in modern philosophy, as the reader will shortly discover when we come to consider the contribution of Janusz Kaczmarek to this volume.

Urszula Wybraniec-Skardowska, in her paper "Logic and the Ontology of Language", which discusses ontological aspects of language, presents a theory of language in which she uses the tools of logic and set theory. She harks back to the logical conception of language proposed by Ajdukiewicz, according to which it consists of a vocabulary and a syntax (i.e. rules for how to build new expressions), a semantics (assigning meaning and denotation to linguistic expressions) and a pragmatics (governing relations between signs and users). The logical approach to language makes language an ideal object, which is no longer the natural language we use on a daily basis. While both logicians and linguists deal with language in their research, it should be noted that they are not really concerned with the same object: a language viewed in terms of logic is a much simpler, idealised construction, and should not be confused with a living natural language composed of concrete expressions. The author of this article exploits this ontological heterogeneity with respect to language, characterizing it in terms of the ontological duality of linguistic expressions: on the one hand such expressions can be construed as concrete objects, like inscriptions on a blackboard, on the other as theoretical objects, such as a class or type. Naturally, the question then arises of which linguistic expressions are to be deemed primitive: is it the case that expression-tokens are

ontologically fundamental (as in concretism), or do expression-types have priority (as in platonism)?

Wybraniec-Skardowska constructs a formal syntactic theory for both platonism and concretism, from which she then derives some ontologically interesting conclusions: it turns out that a syntax built on expression-tokens is logically equivalent to one built on expression-types, where this carries the entailment that a syntax can be constructed without positing abstract objects – something that would certainly be music to the ears of every concretist! However, as Jerzy Perzanowski noted when commenting on this particular author's research, one should also take into account the fact that the proposed equivalence is articulated with the help of set theory, while set theory is itself by no means ontologically neutral. (Even assuming the existence of an infinite set amounts to a strong ontological commitment.) Further to this, the author anyway argues that when we consider matters locally, as internal to the structures she herself proposes, logic favours neither concretism nor platonism. In order to offer readers a fuller picture of her proposed formal ontology of language, Wybraniec-Skardowska also constructs a formal semantics and pragmatics, where these serve to complement other elements within the whole construction.

In the first half of the 20th century, apart from such great figures of Polish philosophy as Kazimierz Twardowski, Stanisław Leśniewski, Alfred Tarski and Roman Ingarden, Benedict Bornstein, who is less well-known, was actively involved in philosophy in Poland. He had the ambition of creating an all-encompassing metaphysical system, which he called the "architectonics of the world". As analytical philosophers often avoided metaphysics, his work was not met with enthusiasm from Kazimierz Twardowski's students. For this reason his achievements, overshadowed as they have been by those of philosophers of the Lvov-Warsaw School, have not had a great impact on the development of ontology in Poland. Nevertheless, Bornstein did forge boldly ahead, and his thinking now looks to have been several decades ahead of his time.

In the course of his ontological investigations Bornstein employed mathematics, including geometry and topology (of a sort fitting their state of development at that time) – something by no means in vogue then, when formal philosophy was principally focused on logical concerns. Elements of his ontological system are presented in the context of an introductory discussion of his work by Krzysztof Śleziński, in his paper "Benedict Bornstein's Ontological Elements of Reality". Bornstein, who, as was already noted above, is not yet well-known as a philosopher, has certainly suffered from the fact that his work is too advanced to be accessible to a wide range of readers of philosophy, in that it requires familiarity with contemporary mathematics. Nevertheless, his ideas were without a doubt moving in much the same direction as those that have since provided the basis for both

the dynamic development of mereotopology and the emergence of spatial logic more generally that we are witnessing today. His philosophical (not mathematical) considerations also count as pioneering in relation to the philosophy of category theory (as introduced by Mac Lane and Eilenberg), where logic and geometry meet again. In his article here, Śleziński points to the directions of research into Bornstein's thought waiting to be undertaken by contemporary ontologists – especially those with a mathematical training and a strong metaphysical temperament. There is certainly much to be done in this area. It is also worth adding that the basic assumptions of Bornstein's conception of metaphysics as a mathematical science go hand in hand with contemporary mathematical philosophy as promoted, for example, by Hannes Leitgeb (cf. Leitgeb 2013).

In the next article, "On the Topological Modelling of Ontological Objects: Substance in the *Monadology*", Janusz Kaczmarek uses topology to model the notion of substance in the context of a Leibnizian approach. This is an example of work in the field of formal ontology, where certain mathematical structures are deployed in order to arrive at an enhanced understanding of issues central to metaphysics. These structures are by no means accidental, as Kaczmarek uses spatial structures (topology being a generalization of geometry) just as Bornstein tried to. Kaczmarek defines substance as an ordered collection of topologies (monads) together with a dominant topology (dominant monad). Such a substance resembles the notion of a system as investigated by Bocheński, Bunge and Ingarden. Kaczmarek highlights this similarity and draws significant conclusions from it. One of the consequences of his definition of substance is the claim that in a substance with more than two elements, other substances can be distinguished. He also provides a criterion of identity for substances. He points out that each substance contains only one dominant monad, and goes on to introduce formal equivalents of certain classical metaphysical concepts: e.g., perception (in many variants) and appetition.

Kaczmarek's paper ends by setting out some currently unresolved problems in the field of topological ontology. In this matter, as in the case of Bornstein's works, there is still much work to be done. Although he does not mention it himself, Kaczmarek's method of analysing philosophical problems remains close to Ajdukiewicz's method of paraphrase: Ajdukiewicz used formal logic, while Kaczmarek suggests using topological structures instead, but both set themselves the task of analysing traditional problems by these means, with Ajdukiewicz rejecting transcendental idealism and Kaczmarek seeking to elucidate the Leibnizian conception of substance.

Mathematical theorems are often taken to furnish a model instance of necessary truth. Yet what does it mean, exactly, for a theorem to be of necessity true? The standard answer from Leibniz states that a necessary theorem is one that is true in all possible worlds. And well, the universe of possible worlds is very

rich indeed, containing as it does everything logically possible. Because of this, the notion of necessity as truth in all possible worlds is often linked to a thesis asserting that for mathematical objects to exist is equivalent in principle to their just being logically non-contradictory. In the universe of mathematics, existence just means logical possibility: the creative power of mathematics is limited only by logical constraints. In his article "Does Mathematical Possibility Imply Existence?", Krzysztof Wójtowicz analyses the thesis that the sheer logical possibility of a mathematical object (i.e. its non-contradictoriness) entails its existence. This realist stance can be expressed in brief as follows: all possible mathematical objects exist. If we reduce mathematics to some kind of basic object, for example sets, then this thesis can be expressed as the claim that all mathematical objects are simply sets. Wójtowicz does not agree with such an ontological reduction: he defends the thesis that mathematical objects exist *per se*, regardless of their multiple representations. In his argumentation he appeals to both advanced results from the foundations of mathematics and ontological intuition, while also referring to mathematical practice.

The next paper – also dealing with mathematical objects – is Rafał Urbaniak's contribution, entitled "Neologicism for Real(s) – Are We There Yet?". The author discusses the ontology of real numbers. In the context of investigations of the foundations of mathematics we encounter various kinds of ontological foundation being proposed for real numbers: in particular, their reconstruction in set theory, which Urbaniak invokes in the third section of his own article. In the main part of his paper, he reviews the project of reconstructing the real numbers in logic, trying to show that it is possible to defend an improved version of the traditional position in the foundations of mathematics, namely logicism, whose main thesis is that mathematics can be derived from logic. The modern version of logicism is – unsurprisingly – known as neologicism. Its main idea is to apply appropriate abstraction principles to the reconstruction of real numbers. A classic example of such an abstraction principle is the one that Frege used to define the notion of extension: F and G have the same extension if F and G apply to the same objects. To put it more formally: $\{x\colon Fx\} = \{x\colon Gx\} \equiv \forall x(Fx \equiv Gx)$. This type of principle engendered Russell's paradox, however, so the application of such principles is subject to a degree of cognitive risk. Urbaniak presents different principles of abstraction and shows how they can be used to reconstruct real numbers. In particular, he presents the reconstructions of real numbers proposed by Peter Simons, Stewart Shapiro and Bob Hale. He then criticises each of these proposals, pointing out their weaknesses: it turns out to be by no means easy to alight upon an abstraction principle that will be neither too strong nor too weak. In his contribution, he also takes up important threads of both an ontological and an epistemological kind that pertain to abstraction principles. For example, he

considers the question of whether such abstraction principles lead to the creation of new abstract objects, and what the principles of abstraction might be for true statements.

One highly popular concept in contemporary logic and ontology is that of possible worlds, which is often explored and entertained alongside that of situations. Jacek Paśniczek explores relations between possible worlds and situations in his paper "Possible Worlds and Situations: How Can They Meet Up?". A possible world is commonly defined as a maximally consistent object, which means that for any proposition A, either A or $\neg A$ can be true in this world, but not both. However, such notions of possible worlds have proved inadequate in the context of certain areas of research – for example, those involving non-classical logic. Thus, the concept of impossible worlds – i.e. worlds in which, for some proposition A, both A and $\neg A$ can be true – has been coined. Such impossible worlds are referred to as "non-normal" worlds, or "non-standard" possible worlds. Paśniczek calls them "n-worlds". In his own contribution, he points out the weaknesses of the set-theoretic approach to n-worlds, and presents an algebraic proposal, built on a suitably enriched De Morgan lattice. Structurally, the set-theoretic and algebraic approaches are equivalent, but it is precisely this equivalence that shows that the concept of a set does not play the most important role in the ontology of n-worlds. Paśniczek's findings indicate that such an ontology can be described algebraically, independently of any language.

Jerzy Perzanowski was one of the most eminent Polish ontologists working at the turn of the 20th and 21st centuries. Perzanowski (1988, p. 87–88) distinguishes three aspects of ontology: *ontomethodology*, *ontologic* and *ontics*. *Ontomethodology* deals with ontological methodology, and its results may take the form of ontological principles, such as Ockham's razor. *Ontics*, meanwhile, is the conceptual analysis of ontological issues, resulting in a description of the ontological universe. (Perzanowski pointed to Roman Ingarden as a typical Polish "onticist".) *Ontologic*, on the other hand, is the study of the logical foundations of the ontological universe in question, with a typical ontologist being the well-known Polish philosopher Stanisław Leśniewski, the initiator of the foundational systems known according to his own terminology as Protothetic, Ontology and Mereology.[2] (We may mention in passing here that Leśniewski remarked of his doctoral students that they were all geniuses. This was in fact so, as his only doctoral student was Alfred Tarski!) Returning to our main story, what results from *ontologic* is the logic of the ontological universe.

2 For a review, see Simons (2015).

The next text in the present volume is Marek Magdziak's paper entitled "The Ontologic of Actions", in which the author sets out to construct a specific logical and ontological basis for ethics. Following Georg Henrik von Wright, Magdziak views actions as intentionally brought about changes to the world: i.e. as the production or omission of states of affairs. Both actions and the states of affairs produced and destroyed by them are particularly important for ethics, as they are – at least arguably – the quintessential bearers of our ascriptions of goodness or badness. (For instance, we find it natural to say such things as "in failing to keep your promise, you did the wrong thing", or "it's good you were evaluated fairly by your teacher".) Magdziak, in his axiomatic system, which is a multi-modal propositional logic, analyses the omission, performance and possibility of actions, together with the production and destruction of states of affairs by a given action; he also introduces and analyses the ethical operators "it is bad that. . . " and "it is good that. . . ". He presents a semantics for his proposed ontologic of action, this being a slight modification of the standard relational semantics for normal modal propositional logic.

The ontologic of action presented by Magdziak articulates a specific ontological basis for ethical reasoning: i.e. reasoning whose conclusion is some action itself. Once again, Magdziak's work is in line with the current of logical philosophy still being vibrantly pursued in Poland today. Such philosophy, though very much alive in Poland, is rather less popular amongst students than contemporary social or political philosophy, for the simple reason that it requires from readers a deep level of concentration combined with an unhurried approach to study. This is something readers can certainly experience for themselves – in, I would venture to add, a wholly positive way – should they be prepared to devote the time and energy required to do justice to Magdziak's contribution.

In his contribution entitled "Physical Intentionality and the Thomistic Theory of Formal Objects", Michał Głowala analyses in detail the similarities and differences between the ontology of intentionality and the ontology of powers (or dispositions). Intentional states, such as acts of love or hate, are directed at their objects: this directedness belongs to their very essence. An important feature of objects of intentional states is that they need not exist: one can, after all, easily imagine an impossible object – even though it does not exist, it can still be an object of imagination. Such properties have come to be referred to by contemporary analytic philosophers as "marks of intentionality". On the other hand, Głowala considers dispositions and their manifestations. An exemplary instance of a disposition would be the solubility of table salt or sugar in water. It turns out that dispositions are also characterized by a certain directedness towards their manifestation, along with the fact that the manifestations of some dispositions need not themselves exist: after all, salt can be dissolved in water, but does not have to be.

For these reasons, some philosophers claim that powers and their manifestations are also characterized by such "marks of intentionality".

Głowala shows that the ontology of intentionality and the ontology of powers are indeed similar, but not by virtue of the fact that they share "marks of intentionality" as such: rather, it is just that these ontologies both exhibit "marks of having a formal object". Głowala presents a study of formal and material objects in the manner of the Scholastics, arguing that such a framework, pitched at a general level, furnishes the proper basis for a unifying conception of intentionality and dispositionality. Roughly speaking, the formal object of *x* is the way in which anything must be related to *x* (or given to *x*) in order to be an object of *x*. For example, if we look at a wheel from the side, we see it as if it were oval: this feature, its being oval, is the formal object of the perception – it is a characteristic of an act of capturing the wheel in experience, not the wheel itself. Głowala warns against hasty analogies with contemporary ontological notions, arguing, for example, that a formal object is not a type whose material objects are tokens. He also argues that it would be a mistake to reify formal objects (the oval I see is not the actual wheel I am looking at). Amongst those who are guilty, in his eyes, of committing this mistake, he mentions both Platonists and advocates of Meinongian ontology. The paper ends with an outline of the difference between the mental and the physical, thus touching on one of the most important ontological issues. It turns out that this fundamental difference is based on the stability or changeability of formal objects.

Głowala joins current ontological disputes provoked by analytical philosophers, drawing inspiration from late-scholastic Thomism, including the thought of Paul Soncinas and Cardinal Cajetan. In this way, he makes up for the absence of a historically informed dimension to many of the analyses put forward within the framework of contemporary analytical philosophy, while at the same time complementing historically oriented approaches themselves with his own pursuit of systematic philosophical analysis. (One might add here that a historical approach to philosophical issues is probably the one most frequently adopted by Polish philosophers. This may be because it represents the easiest option from the point of view of one's not then being obliged to take responsibility for one's thoughts: after all, one is allowed to just reside safely, and respectably, in the shadows cast by the great thinkers of the past.) The approach exemplified by Głowala here is nowadays known as analytically oriented Thomism. While not as popular in Poland as the more firmly rooted existential form of Thomism, it is nevertheless being ever more actively pursued.

The present volume closes with a multi-author contribution entitled "An Assessment of Contemporary Polish Ontology". Here we consider the state of contemporary ontology in Poland. We point out both the strengths and weaknesses of

ontology as practiced in that country in the early part of the 21st century. Among its strengths, we list thirty major achievements on the part of Polish ontologists. Meanwhile, we also seek to address our weaknesses, which we diagnose as possessing many dimensions (including those of an academic, social, or organizational kind, etc.), proposing to remedy these by taking appropriate action aimed at furthering the development of ontology in the future. The authors of this article include not only philosophers, but also representatives of science and engineering – a fact which allows us, we think, to formulate some fairly objective assessments. Such claims are, for sure, not typically encountered in volumes devoted to ontology, so their presence may surprise readers – but perhaps, in our era of global interconnectedness where human beings so quickly become bored, this will be no bad thing! Anyway, we ourselves do believe that such assessments can be helpful when it comes to increasing the self-awareness of a given discipline of knowledge and allowing for its appropriate positioning within the complex network of contemporary academic knowledge and institutions. My own personal hope is that this paper will inspire ontologists from outside of Poland to set out their own aspirations and assessments in similar terms, thus helping to build, and further define the identity of, an international ontological community.

In 2016, Warsaw University of Technology hosted a conference entitled "Polish Contemporary Ontology", during which most of the authors contributing to this volume presented their papers. The conference was organized by the International Center for Formal Ontology, which itself was established in 2015 as part of the Faculty of Administration and Social Sciences of that same university. The Center brings together philosophers and scientists interested in the use of formal tools in ontology – in particular logic and contemporary mathematics, including probability theory, category theory and topology. As can be seen from the contributions to this volume, opening oneself up to a broad-based engagement with mathematical structures and methods need not entail any narrowing of scope in respect of one's field of research. At the Center we address issues that are currently popular in contemporary analytical metaphysics, but also those more commonly associated with what might be described as more of a non-analytical paradigm of ontological research, such as includes phenomenological and even hermeneutics-based approaches.

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