Rational Cognition and Approximate Truth in the Lvov-Warsaw School

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Abstract

The Lvov-Warsaw School's logistic anti-irrationalism, especially as it has been examined in the works of Kazimierz Ajdukiewicz, Izydora Dąmbska, and Jan Woleński, offered an intellectually distinct alternative to the logical positivism of the Vienna Circle. However, the Lvov-Warsaw School's attempt to critique the Franco-German currents of mysticism and romanticism in the late 19th and early 20th centuries, especially in the works of Henri Bergson, open it up to the question of whether its members fully appreciated the consequences of accepting that rational cognition is abstract and schematic. We argue that the abstract nature of rational cognition provides reasons to countenance approximate truth; but doing so seems to put the goal of knowledge out of reach. The consequences of these arguments seem not to have been anticipated in the works of Ajdukiewicz, Dąmbska, or Woleński, and point to a new direction for research about the achievability of certain ambitious goals of the Lvov-Warsaw School's logistic anti-irrationalism.

Keywords: *abstraction; Kazimierz Ajdukiewicz; anti-irrationalism; approximate truth; Izydora Dąmbska; rational cognition; Jan Woleński*

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1. Background

1.1 Verification and the Vienna Circle

By 1929, the logical positivists of the Vienna Circle had codified their metaphilosophical views in a manifesto, entitled *Wissenschaftliche Weltauffassung: Der Wiener Kreis*. Using a semantic principle that emphasised a notion of verification, they sought to replace certain subdisciplines of philosophy deemed too speculative, such as metaphysics and ethics, with an empirically informed scientific philosophy steeped in the study of logic and syntax. While not all members subscribed to the principle of verification, or even to the same version of the principle, it became a central intellectual stratagem of the Vienna Circle.[1]

[1] For present purposes, our focus will be on early formulations of the verification principle, since they are the strongest and most frequently cited. Later formulations—particularly as described by Ayer (1959), Achinstein & Barker (1969),

Broadly speaking, the principle may be understood as claiming that a declarative sentence σ is cognitively significant only in so far as σ can be verified. For the logical positivists, a speaker purporting to assert something that is not empirically verifiable vocalises an expression that has no sense; nothing is asserted. An unverifiable sentence is neither true nor false in just the same way that "time is thinner than space" is neither true nor false, but instead just meaningless. Moritz Schlick wrote:

> Stating the meaning of a sentence amounts to stating the rules according to which the sentence is to be used, and this is the same as stating the way in which it can be verified (or falsified). The meaning of a proposition is the method of its verification. (1936, 341)

Likewise, Alfred Ayer is also representative of this account:

> [W]e shall maintain that no statement which refers to a "reality" transcending the limits of all possible sense-experience can possibly have any literal significance […]. The criterion which we use to test the genuineness of apparent statements of fact is the criterion of verifiability. We say that a sentence is factually significant to any given person, if, and only if, he knows how to verify the proposition which it purports to express—that is, if he knows what observations would lead him, under certain conditions, to accept the proposition as being true, or reject it as being false. (1946, 34–35)

And here is Carl Hempel, writing about the verification principle as it was used in the early days of the Vienna Circle:

> [A] sentence was said to have empirical meaning if it was capable, at least in principle, of complete verification by observational evidence; i.e., if observational evidence could be described which, if actually obtained would conclusively establish the truth of the sentence. (1959, 110)

The principle of verification was developed in different ways. For the Wittgensteinians within the Circle, what is expressed by a declarative sentence σ is meaningful only if it pictures reality (*cf.* Wittgenstein 1921/1997, §2). Sometimes the principle was formulated negatively: if a sentence is not empirically verifiable, then it has no cognitive significance. Other positivists later emphasised

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Pap & Edwards (1967), and Skolimowski (1967)—were not shared by all members of the Vienna Circle. This becomes more salient with the evolution of logical positivism of the 1920s into logical empiricism of the 1940s.

different ways of revising or developing it: rule following for Schlick, projectable observation for Ayer, and so forth. But they generally agreed that certain grammatically well-formed declarations of kind *k* about reality (hereafter '*k*-declaratives') are semantically defective to the extent that their truth-value could not be checked against the justificatory powers of observation; and they were generally disposed to think that assertions of such sentences involves a failure to satisfy certain norms of rationality.

Given these earlier and stronger forms of the verification principle, the attack on various kinds of speculative philosophy becomes simple and direct:

1. All *k*-declaratives are empirically unverifiable.

2. All empirically unverifiable *k*-declaratives are meaningless.

∴ 3. Therefore, all *k*-declaratives are meaningless.

According to some of the staunchest positivists, substituends for '*k*-declarative' included various metaphysical and ethical pronouncements. Unfortunately, simple and direct arguments often run into simple and direct objections. For instance, premise (1) ascribes a property to all members of a class. But subclasses $k_1, \ldots, k_n$ will contain infinitely many sentences, given certain features like compositionality, productivity, and systematicity. And it is difficult to conceive of a method that can be executed in in polynomial time for verifying that each sentence $\sigma \in k_i$ has the property so ascribed. Consequently, it becomes unclear whether all *k*-declaratives are empirically unverifiable, and thus unclear whether premise (1) could be true. So, the argument may be unsound, unless the quantifier is diminished in scope. Worse, premise (1) itself appears to be empirically unverifiable, and thus a member of itself. But now, if the meaning of a *k*-declarative is its method of verification and there is no method of verification for (1)—i.e., no observation against which we could we test whether or not all *k*-declaratives are empirically unverifiable—then it also becomes unclear whether premise (1) is itself meaningless. And without premise (1), the argument is in trouble; for there is no valid inference from premise (2) to (3). Famously, the same problem recurs with the

principle of verification itself in premise (2). Against which observation could we test whether or not all empirically unverifiable *k*-declaratives are meaningless? The positivists were familiar with these problems, of course, and offered various parries. Whether or not any were ultimately successful, it seems that the principle of verification is a strong brew.

1.2 'Too Sober for That': The Lvov-Warsaw School's Rejection of the Vienna Circle's Dogmatism

Less well-known but equally important was the school founded in Lvov by Kazimierz Twardowski, and promoted by Jan Woleński. The relationship between the Vienna Circle and the Lvov-Warsaw School has been the subject of various investigations, and the directions of influence and many conduits by which members of both groups shared ideas are still being plumbed. Many members of the Vienna Circle, such as Schlick, Rudolf Carnap, Otto Neurath, and Karl Popper were keen to develop intellectual ties to the Lvov-Warsaw School, and their students, such as Rose Rand, made close studies of the works of Twardowski's students. Members of the Vienna Circle were particularly attracted to the Polish philosophers' so-called *logistic anti-irrationalism*, given their common focus on logic, mathematics, and other areas of science that exemplify human rationality.

It is sometimes said that the Polish philosophers of the Lvov-Warsaw School during the interwar period allied themselves with the Vienna Circle. For example, in his discussion of logical positivism, Ayer wrote that "[a]n alliance was […] formed with the very important Polish group of philosophers and logicians, of whom Lucasiewicz (sic), Lesnievsky (sic), Chwistek, Kotarbinski, Ajduciewicz (sic), and Tarski were perhaps the most important" (1959, 6). Barry Smith described Tadeusz Kotarbiński and Kazimierz Ajdukiewicz as "[…] philosophers later closely allied to the Vienna logical empiricist movement" and suggested that Ajdukiewicz in particular was "attracted by the positivism or reductionism of the Vienna Circle" (1994: 21, 158). And Ajdukiewicz's assistant, Maria Kokoszyńska, has been called "'an ambassador of the Vienna Circle in Poland' and an "'ambassador of the Lvov-Warsaw School in Vienna"' (Brożek 2017, 18).

While it is understandable why some might imagine an affinity between these two groups, the confluence of their respective philosophies remains an unsettled question, and there are reasons to suppose that the Lvov-Warsaw philosophers were more diffident about such an alliance than their Austrian counterparts in Vienna. What united them was a shared methodological framework that valued linguistic precision and rational justification, which came to be known as "logistic anti-irrationalism." The issue of verification and testability are a central part of logistic anti-irrationalism, and this is part of their purported connection. But while the Vienna Circle and the Lvov-Warsaw School may have been allies against the proliferation of speculative philosophy, the complete rejection of speculative philosophy as meaningless was not something widely adopted by the latter. Criticisms of the principle of verification by members of the Lvov-Warsaw School suggest that the two schools of thought were not nearly as on a par as we might have first thought. At the 1934 International Congress of Philosophy in Prague, Ajdukiewicz announced, "[t]here are no unreserved supporters of the Vienna Circle in Poland; I do not know of any philosopher who has accepted and adopted the actual contents of the theses propounded by the Vienna Circle" (1934/2001, 241). And in a letter to Wladyslaw Tatarkiewicz dated 18 February 1948, Ajdukiewicz echoed the sentiment: "[i]n any case I would not like to be included among neo-positivists" (cited in Woleński 1989b, 445). Ajdukiewicz's announcements were affirmed by Jan Łukasiewicz, who added: "Professor Ajdukiewicz was right when he wrote about logistic anti-irrationalism in Poland that he did not know any Polish philosopher who would accept the material theses of the Vienna Circle as his own. We are, it seems, too sober for that" (1970, 233; Skolimowski 1967, 76 and Woleński 1989, 444–445; Brożek 2017, 23). More generally, members of the Lvov-Warsaw School urged caution against accepting the commitments of logical positivism, being more sanguine and tolerant of metaphysical thought than the positivists. As Łukasiewicz remarked, "For Ajdukiewicz while rationality is a basic criterion of scientific research, it should also be understood to have social significance: it should be used, in everyday activities, to preclude nonsense and false beliefs.

In spite of such declarations, Ajdukiewicz was not an enemy of metaphysics in general" (2009, 27). Likewise, Zygmunt Zawirski wrote:

> Polish philosophers […] were treated by representatives of logical postivism as coming close to their standpoint. That was right to some extent, but not very much, because Polish scientific philosophy did not share the most important point of old and new positivism. A radically anti-metaphysical attitude is the essence of positivism. Yet Polish scientific philosophy did not preclude the possibility that at least some issues of traditional metaphysics […] should be treated in a scientific manner. (1947, 6–7 quoted in Woleński 1989a, 445)

While some members of the Lvov-Warsaw School may have held views that were friendly toward logical positivism, they exhibited a much greater diversity of views: e.g., reism (Kotarbiński), nominalism (Leśniewski), objectivism (Kokoszynska), physicalism (Tarski), realism (Ajdukiewicz), and anti-realism (Poznanski & Wundheiler). Within this diversity of views, too, there were various attempts to take seriously various metaphysical issues pertinent to scientific philosophy, and to repair or improve upon those as needed rather than to cast them off as impairments.

The aim of this paper is to explore some consequences of the Lvov-Warsaw School's critique of irrationalism. First, we will describe the commitments of their logistic anti-irrationalism, especially as it manifested in the lineage from Ajdukiewicz through his contemporaries, such as Izydora Dąmbska, to Woleński. While the Lvov-Warsaw School diverged from the Vienna Circle, some of its members modeled logistic anti-irrationalism on, at least in part, the verification principle. But they also went beyond this principle in constructing a serviceable conception of scientific or rational cognition. In so doing, anti-irrationalists appear to have been committed to the nature of rational cognition being, at least in some measure, abstract and schematic. We suggest that an implication of this commitment seems to be that the kind of truth characteristic of scientific endeavours will be approximate truth. Despite the Herculean effort of Woleński et al., the school's paradigmatic principles risk falling short of their goals if not developed further. Clarifying and

developing the understanding of approximate truth within the principles of the Lvov-Warsaw School's logistic anti-irrationalism is one promising future direction.

2. Logistic Anti-Irrationalism of the Lvov-Warsaw School

2.1 Rationalism and Beyond

Leon Chwistek, a de facto member of the Lvov-Warsaw School and member of the Cracow Circle, colorfully summarised the general antipathy in Poland toward certain misbegotten philosophies in the 19th and early 20th centuries. For Chwistek, the problematic source turns out to be the German romanticists, and Hegel in particular, whose "doctrines resulted from misunderstandings which were caused by a superficial knowledge of Kant's philosophy and a completely erroneous conception of mathematical analysis" (1948, 12). Chwistek described Hegel as a talented propagandist who exploited the popular fantasies of the day, and describes his philosophical views as a "mass of nonsense and pretentious poppycock," as if "a practical joker had cut parts of sentences out of scientific works and put them together arbitrarily in order to stupefy and frighten mankind" (1948, 13). Whether the Polish philosophers of the interwar and postwar period shared Chwistek's rhetoric, they mainly shared the sentiment: what the Hegelians called "rationalism" was not characteristic of the sober scientific philosophy that they aimed to offer.

If Hegel was, according to Chwistek, "the source [of anti-rationalism] to be sought and definitively eliminated" (1948, 12), it was the early 20th century variants of anti-rationalism that frustrated the progress of his philosophical heroes and prevented the fait accompli of rationality, scientific progress, tolerance, and social justice (1948, 11).[2] "The plague of anti-rationalism cast into the world by Hegel spread to fantastic bounds," wrote Chwistek, "[and a]fter the war, Europe

[2] Besides Brentano, the heroes mentioned by Chwistek were Isaac Newton, August Comte, Ernst Mach, Henri Poincaré, and Albert Einstein—a positivist-friendly group of 'critical investigators', characterised by the avoidance of certain kinds of metaphysical questions (e.g., "what is this?," "why is it so?," "why not otherwise?") that were said to lead to fruitless investigations.

was swamped by vast numbers of irresponsible anti-rationalistic systems which in the main yielded nothing new" (1948, 14). Among those heroes was the Austrian intellectual grandfather of the Lvov-Warsaw School in Vienna, Franz Brentano. Brentano is often interpreted as having suggested that no philosophical or psychological work should be undertaken unless it is informed by natural science: "*Vera philosophiae methodus alia nisi scientiae naturalis est* [No other method but the philosophy of natural science]." This kind of tie to naturalistic philosophy was uncharacteristic of German romanticism and idealism, and very much characteristic of the kind of the philosophy of interest to the Vienna Circle and the Lvov-Warsaw School.

2.1.1 Twardowski's Tripartite Distinction

From the very outset of its founding by Brentano's student, Kazimierz Twardowski, the Lvov-Warsaw school sought to modernise both rationalism and empiricism by integrating it with the best science of the day in ways that would resolve philosophical problems. In epistemology, rationalism has traditionally been distinguished from empiricism. Whereas empiricism has been understood to take all knowledge to originate in, and be justified by, sense experience and observation, rationalism takes at least some knowledge to be derived through reason alone or to be justified a priori. While this orthodox distinction between rationalism and empiricism was generally respected by members of the Lvov-Warsaw School, they framed the debate slightly

differently.[3] The epistemological rationalism that traditionally opposed empiricism was distinguished from the methodological rationalism that opposed what they called "irrationalism."[4]

Twardowski was not a philosopher of science in the contemporary sense of the term, and did not fit squarely within the positivistic confines of 19th century philosophy of science; but his work on the intentional conception of consciousness was informed by Brentano's empirical psychology (Albertazzi 1993; Perszyk 1993; Poli 1996; Smith 1995), and he inherited from Brentano a clear-eyed desire to augment knowledge about the mind with empirically testable measures of natural science.

Like Brentano, Twardowski's metaphilosophical view was that of a naturalist; but his program shares some common ground with the methodological rationalism of his like-minded philosophers and students, such as Chwistek and Ajdukiewicz (1934/2001, 242; 1949/1973, 46–48).[5] Yet, there were also subtle differences. While Twardowski's approach was founded on his appreciation of methodological rationalism, he himself—according to Ajdukiewicz—"did not belong to the anti-irrationalism orientation with a logistic slant [… and] Twardowski's anti-irrationalism is also discernible in the writings of those of his disciples whose research was not affected by logistic." (1934/2001, 242, 243).

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[3] Rationalism was called "apriorism," and apriorism was subdivided into two variants: radical and moderate. According to radical apriorism, observation statements are not ultimately scientifically respectable because no amount of justification can provide them with evidential support. "The assertion that only reason and not experience acquaints us with reality was the thesis of radical apriorism" (Ajdukiewicz 1949/1973, 26). According to moderate apriorism, however, not all such statements are justified only by means of experience or only by means of analytic statements. Mutatis mutandis, there is a distinction between radical and moderate empiricism. Radical and moderate empiricism were summarised in the following way: "[c]haracteristic of radical empiricism is the thesis according to which only empirical sentences have scientific status. Moderate empiricism, on the other hand, grants such status not only to empirical sentences but also to sentences which are valid in virtue of the meanings of expressions occurring in those sentences" (Ajdukiewicz 1947/1978, 165). Toward the end of his career, Ajdukiewicz evolved into a moderate empiricist (*cf.* 1949/1973, 35–45).

[4] For more brief and more careful discussions of the distinction between empiricism and apriorism, see Ajdukiewicz (1947/1978, 174–175) and (1954/1978): 306–318), respectively. Skolimowski (1967, 160–164) has a summary of Ajdukiewicz's views evolving from moderate to radical empiricism. While these are important developments in his views, we set aside a discussion of Ajdukiewicz's later empiricism to focus on the nature of anti-irrationalism.

[5] Woleński summarised this common ground as follows: "[a]dmitting only those judgements that are intersubjectively controllable is equivalent to the claim that the genuine method of philosophy is the same as the method of science" (2013, 19).

In his commemorative address before the 25th anniversary meeting of the Polish Philosophical Society, Twardowski proposed a tripartite distinction between rationalism, irrationalism, and non-rationalism. As he understood these terms, rationalism celebrates those beliefs that have as their source or justificatory origin the natural and physical sciences. By contrast, irrationalism focuses on those beliefs that are founded in special intuition or mystical experience but which need not be discordant with science. Non-rationalist beliefs are those are do not accord with science. As Peter Simons rightly observes, 'The terminology is not optimal. It would be better to call beliefs opposed to rational ones irrational and those which are not acquired scientifically but need not be in conflict with science non-rational' (2017, 9). Despite its clumsy terminology, Twardowski's distinction inspired his students to develop these notions further.

2.1.2 Dąmbska's Irrationalism Tetrad

Twardowski's students were quick to note that terms like *rationalism* and *irrationalism* do not have a single, fixed, and precise meaning. For her part, Dąmbska (1937/2016) developed Twardowski's brand of rationalism so as to distinguish between at least four kinds of irrationalism: logical irrationalism, psychological irrationalism, metaphysical irrationalism, epistemological irrationalism.

For Dąmbska, logical irrationalism is a thesis about the properties of certain subclasses of declarative sentences, such as being internally contradictory or undecidable. A sentence λ is logically irrational just when λ is committed to either logical or empirical impossibilia. By contrast, psychological irrationalism is the thesis that people have irrational tendencies. A person *S* is psychologically irrational if *S* is doxastically prepared to accept λ.[6] Metaphysical irrationalism names the thesis that reality itself is irrational. Unfortunately, Dąmbska's charaterisation of the concept

[6] By this scheme, contemporary irrationalists would include a wide variety of people, from various hucksters and charlatans, politicians, seminarians, theologians, etc. to certain philosophers of science like Feyerabend (1987), dialetheists like Priest (1987), and some paraconsistent logicians like de Costa (1974). The first developed paraconsistent logic was that of Łukasiewicz's student, Stanisław Jaśkowski (1948/1999).

IRRATIONAL REALITY was exceedingly brief; but the conception she seems to have had in mind was that the imputation of λόγος to reality necessarily fails. Metaphysical irrationalism might be described by the corollary that phrases like *the logical structure of reality* are non-denoting, or alternatively, by the claim that the mismeasure of reality is metaphysically necessary. Dąmbska wrote, "[t]he irrationality of reality is expressed [by the claim] that every attempt to describe [reality] in a conceptual way by the human mind distorts it" (1937/2016, 74).

Another set of views, which Dąmbska claims follows from metaphysical irrationalism aims to justify a manner of cognizing that establishes the legitimacy of logically irrational statements. Dąmbska divided these views into pragmatism and epistemological irrationalism, exemplified by William James and the medieval Scottish mystic Richard of St. Victor, respectively, and she might have added Ludwig Klages. Common to the epistemological irrationalists is the thought that certain experiences are inexpressible, and it is this particular thought that was propounded by irrationalists like Henri-Louis Bergson and that attracted special attention from the members of the Lvov-Warsaw School—namely, Ajdukiewicz.

2.1.3 Ajdukiewicz's Third-Personal Methodological Anti-Irrationalism

Ajdukiewicz described the Lvov-Warsaw school's methodological attitude by reference to three pillars or hallmarks (1934/2001, 241). One hallmark was described as the "logistic conceptual apparatus," which concerned the powerful techniques of formal logic. Another was linguistic precision.[7] A third hallmark was methodological rationalism, which Ajdukiewicz characterised as 'the postulate stating that only such propositions can be acknowledged which are justified in a way that can be verified' (1934/2001, 241). This third hallmark makes it appear as if the Lvov-Warsaw

[7] The hallmark of linguistic precision, which Ajdukiewicz later called 'intersubjective communicability' was a longstanding concern of Twardowski's. For instance, in his 'On clear and confused styles of philosophical writing' (1919/1979), Twardowski argued that expressive obscurity is the immediate presentation of unclear thought, and the immediate presentation of unclear thought is not an inevitable consequence of the abstract nature of the philosophical endeavor.

School was after a truth-conditional theory of justification, and his characterisation appears to be consistent with, if not an endorsement of, the truth-conditional theory of meaning that motivated the Vienna Circle's verification principle.[8]

The view specifically referred to by Ajdukiewicz as "logistic anti-irrationalism" peels away from Twardowski's tripartite distinction as well as the traditional distinction between rationalism and empiricism in epistemology. As we shall see, it incorporates this third hallmark and is geared toward the rejection of the epistemological irrationalism characterised by Dąmbska. It focuses on the distinction between third- versus first-person approaches to the production of scientific knowledge—two approaches are at the heart of the metaphilosophical and methodological views of the Lvov-Warsaw School and their opponents.

In his *Problems and Theories of Philosophy* (1949/1973), Ajdukiewicz later characterised anti-irrationalism as the conjunction of two theses. Firstly, rational knowledge must be intersubjectively communicable. Secondly, rational knowledge must be intersubjectively testable. He wrote,

> Scientific cognition is first such and only such content of thought as can be communicated to others in words understood literally, that is without metaphors, analogies and other half-measures for the transmission of thought. Secondly, only those assertions can pretend to the title of scientific cognition whose correctness or incorrectness can be decided in principle by anybody who finds himself in the appropriate external conditions. In a word, scientific cognition is that which is intersubjectively communicable and controllable. (1949/1973, 46)

This formulation of Ajdukiewicz's methodological rationalism captured some virtues of good scientific practice. The first condition, intersubjective communicability, is equivalent to the second of the three hallmarks of the Lvov-Warsaw School—namely, linguistic precision. For Ajdukiewicz, thought or cognition, if it is to count as rational, must be articulated clearly and literally, without

[8] This socialised form of science traces back at least to Jan Śniadecki, an ardent critic of Kant, Romanticism, and 'metaphysical fantasy' (Ajdukiewicz 1934/2001, 242–245).

resorting to metaphors or vagueness. The second condition, intersubjective testability or verifiability, requires that statements and theories have the kind of content that would subject it to the results of empirical investigation or experimentation. This second condition incorporates the verificationist concerns of the logical positivists, and helps ground claims of the continuity between the Vienna Circle and the Lvov-Warsaw School. Third, the condition of precision and clarity lends itself to the cognition's accuracy.

Ajdukiewicz remarks that rationalism values only rational cognition, where cognition is rational only if it satisfies two requirements: (i) its literal meaning can be communicated to others, and (ii) its correctness is decidable only in the appropriate external conditions. He wrote, "[r]ationalism proclaims that we can announce our convictions and call for their universal acceptance only when they can be clearly formulated in words and when everybody can (at least in principle) assure himself of their correctness or incompleteness" (1949/1974, 46). So, the twin theses of this kind of rationalism are that rational cognition must be intersubjectively communicable, and rational cognition must be intersubjectively testable.

Woleński has interpreted Ajdukiewicz's logistic anti-irrationalism as the view that "only such statements should be accepted which are justified by intersubjective means" (2013, 13). On this interpretation, justification is a crucial condition on the acceptability of statements, and intersubjectivity is a crucial condition on justification. To the extent that justification by intersubjective means can be tied to verification, this interpretation may be able to deliver claims about the conceptual proximity of logistic anti-irrationalism to the Vienna Circle's logical positivism.

2.2 Irrationalism

Ajdukiewicz's methodological rationalism also had an explicitly social justification. Besides prohibiting scientists from accepting laws or principles that are untestable or unfalsifiable (*cf.*

Popper 1959; 1963/2002), it aimed "to protect society from the domination of the meaningless cliché which often has a strong emotional resonance and, because of this, influences individuals and whole social groups" (Ajdukiewicz 1949/1973, 46).[9]

Two strains of concerns—one less philosophical and the other more so—are noticeable in the writings of Twardowski, Ajdukiewicz, Dąmbska, Chwistek, Woleński and others. Their broader concern seems to have been concentrated on a certain pedestrian kind of mysticism or spiritualism:

> People usually accept religious beliefs under the influence of the environment in which they grow up: their faith usually has a traditional character, is 'the faith of their fathers' in which they are immersed from childhood without any effort on their part to examine their beliefs or opinions. Only a few individuals try to resolve by their own reflection the problems to which ready answers are given by the religious beliefs bequeathed by tradition. Now these attempts are usually considered to be a kind of philosophizing and they are usually included within the scope of metaphysics. In the practice of religious metaphysics some attempt to apply rational methods, some apply irrational ones. The latter are called mystics. (Ajdukiewicz 1949/1973, 152–153)

The irrationalists' methods that Ajdukiewicz had in mind—"revelation, all divinations, forebodings, prophesies, crystal-gazing, etc." (1949/1973, 46)—are said to give rise to certain kinds of experiences:[10]

> In these experiences they undergo revelations in which they gain (not by means of reasoning and scrupulous observation) subjective certainty, most often as to the existence of a deity, they experience its existence as if face to face, they receive direct instructions, admonitions and orders from it. People who undergo such experiences cannot be argued out of their conviction of the certainty of knowledge gained in states of ecstasy, and they are even less shaken by the judgments of rationalists about their faith. (Ajdukiewicz 1949/1973, 48)

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[9] For overlap between Popperian falsifiability and the demarcation between science and pseudo-science, and views of the members of the Lvov-Warsaw School, see Jonkisz (2017) or Kleszcz (2017).

[10] One motivation for working on this topic is that, sadly, the Polish worries about irrationalism are still in play a century later. Ajdukiewicz's examples are not mere historical curios of the distant past, and he could have added faith-healing, the use of essential oils to ward off measles, chakra re·alignment, and conversion therapy, among many others.

> Suppose that a mystic recommends as a piece of knowledge his or her mental content concerning trans-empirical reality and reporting a direct contact with God. One can ask "Well, but you are the only person experience your direct meeting of God". The mystic's expected answer is "OK, but you must have similar trans-empirical experiences in order to understand what is going on in my own case. Please try, because this experience is fairly possible". And if the second person will say "I am sorry, but I did not succeed," the mystic's reply probably would be "It is your fault. Try again". […] [In this case,] we have the lack of intersubjectivity. […] [T]he reports of mystical experience use a private language, which excludes controllability. (Woleński 2015, 27)

This broader concern was not limited to mysticism or spiritualism, however. Ajdukiewicz included other kinds of disordered mental states and sociopathic cognition, whether that of the "saint as well as a madman and finally a fraud" (1949/1973, 46, 49). Indeed, the broader concern was that civil forfeiture of rationality creates the conditions under which various kinds of pernicious movements can flourish. As Dąmbska remarked, "When irrationalism prevails, great systems of religious mysticism are created, metaphysics rules in philosophy, and social life abounds in providential leaders, indiscriminate fanaticism and the sense of supernatural historical missions" (1937/2016, 77). Likewise, for Ajdukiewicz, the aim of resisting and eliminating this kind of street-level anti-rationalism was to generate a kind immunity to general social rot:

> The point here is, first, to protect society from the domination of the meaningless cliché which often has a strong emotional resonance and, because of this, influences whole social groups; and, secondly, in order to give protection from the uncritical acceptance of views proclaimed by their adherents sometimes with the full force of conviction but which are inaccessible to testing by others and thus might be suspected to be false. The point is to protect society from nonsense and falsehood. (1949/1973: 46)

In these passages, one sees immediately that the concerns of the Lvov-Warsaw School exceeded the traditional debate between rationalism and empiricism, and were focused more broadly on the healthy scrutiny of the pedigree of various beliefs and the exchange of reasons in support of them.

The second, more narrow concern seems to have been concentrated on specifically philosophical disputes over whether or not there is something of an experience lost in the

expression of it—some ineffable quality or aspect that individuals are privy to, but which cannot be communicated to other subjects. Prominent among the philosophical superpowers of Germany and France were academics and intellectuals like Wilhelm Dilthey and Bergson, who supposed so.

Bergson proposed the so-called method of "sympathetic intuition," which was said to be a mode of experiencing whereby the broadly Kantian division between cognition and its object become indistinct. Bergson conceived of this as cognition "entering into" its object through a process of "sympathy," the idea being that, roughly, through sympathetic intuition one envisions the nature of things in ways that deliver up "possibilities of absolute knowledge" and in ways that are not visible to traditional enlightenment methods.

Because of his claims that the elements of feeling and experience are in constant flux, Bergson has been associated with certain kinds of Heraclitean views. "The feeling itself is a being which lives and develops and is therefore constantly changing," he wrote (1910, 132–133). Bergson supposed that this lively elementary flux can be recruited for linguistic communication, but is distorted or destroyed in the process: "[…] we cause this feeling to lose itself and its color. Hence, we are now standing before our own shadow: we believe that we have analysed our feeling, while we have really replaced it by a juxtaposition of lifeless states which can be translated into words" (1910, 133). It was, for Bergson, this pressing of feeling into the service of language that both provides for the process of intersubjective communicability of cognition while undermining the experiences on which they are based:

> In short, the word with well-defined outlines, the rough and ready word, which stores up the stable, common, and consequently impersonal element in the impressions of mankind, overwhelms or at least covers over the delicate fugitive impressions of our individual consciousness. To maintain the struggle on equal terms, the latter ought to express themselves in precise words; but these words, as soon as they were formed, would turn against the sensation, which gave birth to them, and, invented to show that the sensation is unstable, they would impose on it their own stability. (1910, 132)

Cutting through Bergson's florid prose, his thought was simply that language works only by imposing a kind of stability on sensory impressions. But the essence or nature of the human sensorium is that of a protean flux, thought Bergson; and so what is captured in the linguistic imposition of stability is not essential to experience, nothing real.

While members of the Lwow-Warsaw school were unsympathetic with Bergson's irrationalism, they acknowledged that something can be "lost in translation" from the content formed in perception and experience to the content formed in expression and communication. Ajdukiewicz, for instance, wrote that "Rational cognition pays a high price for its intersubjective character" (1949/1973: 47). The 'high price' alluded to by Ajdukiewicz is that rational cognition seems to be unable to simultaneously satisfy two desiderata. On one hand, the goodness of rational cognition lies in its capacity to be true of its object. Satisfying this desideratum requires that rational cognition preserve the informational features of what is being represented. On the other hand, the utility of rational cognition lies in its capacity to be recruited for intersubjective communication. But because language is quick and dirty and built for speed, satisfying this desideratum requires that rational cognition be modified to generate certain features, such as expressive power, that are needed to effect successful communication.

Satisfying both of these desiderata means being pulled in two directions. For Ajdukiewicz, something must thereby be lost in rational cognition:

> 'It becomes schematic, abstract, and it loses its intimate contact with the object [… W]hat can be conveyed to others of our knowledge about the objects given us in direct experience is only a schema, is always an abstraction which the hearer must fill out with concrete content on his own responsibility and it will not necessarily be identical with the content we attempted to convey by means of the words used in our description. What can be conveyed of our knowledge of objects in words […] will always preserve a certain distance and it will not express such an intimate contact with them as the contact which we establish with them by perceiving them or experience them' (1949/1973, 47–48).

As he seems to have understood it, the problem is that knowledge of reality requires immediate contact of cognition with its object; for mediation by intervening layers of representation introduces the possibility of error and increases its likelihood, but also just pushes the problem backward (since, eventually, some form of presentational "contact" is necessary to relate the object of cognition). Yet, the preservation of informational completeness that accompanies the immediate contact of cognition with its object precludes it from being useful in communication. As Ajdukiewicz seems to have recognised, this opened the opportunity for Bergson to claim a special kind of cognition, which enables intuitive knowledge of reality but which is inexpressible in language, and thus irrational.

3. Intersubjective Communicability, Abstraction, and Approximate Truth

3.1 Rational Cognition and Approximate Truth

In rational cognition, a variety of cognitive processes are recruited that allow cognizers to direct or adjust cognitive resources toward an experience or aspect of an experience for the purpose of selecting it as an explicit focus of attention. A salient exemplar is the process of profiling in linguistic semantics (sometimes also called 'foregrounding'), in which a particular substructure within a cognitive domain is brought to prominence as the intended semantic structure of an expression (e.g., the construal of the elongated portion of a pencil, arrow, golf club, or other such tool in *shaft*). Others include the processes by which scale is imposed on conceptualisations of an object (e.g., *pond* versus *lake*) or scope; and another important exemplar of these cognitive processes is abstraction. Together, these operations comprise the class described as 'focal adjustments involving selection'—i.e., construal operations by which we attend to aspects of experience that are task-relative and purpose-relevant, and ignore other aspects of experience that are irrelevant.

The philosophical problem with which Ajdukiewicz struggled concerns the abstraction away from experience. In abstraction from an experience, rational cognition undergoes a kind of 'information leakage', where the detail involved in certain conceptualisations is omitted (e.g., *gobbled apfelstrudel* versus *ate dessert*). For Ajdukiewicz, abstraction from experience is required to create the conditions under which the intersubjectivity of communication is both possible and possibly solves the problem of shared content. By the same token, abstraction from the specificity of experience can decrease satisfaction of certain norms of representation, such as completeness, maximal accuracy, and extreme precision. Hence, as he put it, conveying our conceptualisations of our experiences of the world is facilitated by abstracting from those experiences; but in doing so, the intimate contact which we establish with the objects of our perception or experience is relinquished (1949/1973, 47–48).

For rational cognition to be both intersubjectively communicable and intersubjectively testable, the focal adjustments of selection cannot be dramatically askew. Overly specific conceptualisation of experience diminished the conveyability of the cognition for scientific purposes, while overly schematic conceptualization misses out on the relevant level of detail. The imposition of excessive abstraction or schematicity can dramatically alter the semantic value of declarative sentences, and thus—at least potentially—their truth-value. Because rational cognition is subject to degrees of skew, and because abstraction involved in rational cognition involves the omission of detail, a scalar approach to the conception of the truth-value of declaratives appears to be merited. 'Truth' becomes shorthand for maximal accuracy, and approximate truth becomes the operative conception.

3.2 Science and Approximate Truth

On at least one conception of science upheld by Ajdukiewicz and others, science is the search for knowledge. This conception is supported by the usual etymological facts, which enshrine the

connection between science and knowledge through the terms *ἐπιστήμη* in Greek and *scientia* in Latin, both of which mean knowledge. Unsurprisingly, then, members of the Lvov-Warsaw school were amenable to claims like 'knowledge is a, or even the, central aim of science', or 'science aims at learning about the world in ways the generate knowledge of how it works'. So it seems reasonable to assume that, for members of the Lvov-Warsaw School, science is at least the search for knowledge.

Classically, knowledge is at least sufficiently justified true belief. This is just a weakened form of the classical definition of knowledge from the *Theaetetus* and elsewhere in the history of epistemology (cf. Woleński 2004). Most philosophers accept some variant of it, presumably, or would accept a suitably adjusted successor. All that's needed is recognition that, for friends of the Lvov-Warsaw School, any serviceable conception of knowledge should provide for the entailment from knowledge to truth. For our purposes here, nothing else is required.

Together, these last two thoughts give us two premises in a broader argument that puts pressure on the Lvov-Warsaw School's claims about the rationality of science:

1. Science is the search for knowledge.

2. Knowledge is at least true justified belief.

The issue of approximate truth immediately enters here. We have seen that the commitment to rational cognition involves a 'high cost'. One might wonder that the cost is higher than Ajdukiewicz appreciated. We have not discussed the classic problem of shared content, which the requirement of intersubjective communicability ignores rather than addresses. We have also not discussed whether the abstraction involved in rational cognition opens the door to legitimating the special kind of intuitive-but-inexpressible knowledge of reality claimed by irrationalists like Bergson. What we have suggested is that anti-irrationalists like Ajdukiewicz, Dąmbska, and Woleński should be prepared to develop a conception of approximate truth suitable to their

analysis of the nature of rational cognition. This conception may have interesting implications for their general approach to scientific philosophy, however.

A conception of approximate truth may seem like a welcome addition. It appears to be required to account for scientific progress, for instance. For another, in contemporary debates between scientific realists and anti-realists, the concept of approximate truth is needed to qualify the realist's thesis, and thus to produce the grounds for a debate between realists on one hand, and anti-realists and empiricists on the other. Of course, as we have seen, not all members of the Lvov-Warsaw School were scientific realists, though several were, and several others were committed by their other metaphilosophical views. But the issue of realism only plays a heuristic role, here, in showing why approximate truth is often required. Like methodological naturalists and rationalists, realists antecedently acknowledge that our current science is like the sciences of the past in that it can be improved upon; but such improvement requires acknowledging that our current science cannot also then be regarded as the 'final truth' about phenomena in their domain. Were one able only to appeal to truth in this sense, one could only get scientific knowledge at the end-of-inquiry; and science is never at the end-of-inquiry. So, again, a conception of approximate truth may seem like a welcome addition.[11]

The problem, however, is that truth appears to be a cognitive ideal or regulatory norm over scientific progress, which science both must aim at but cannot achieve. This generates a third premise,

3. Science never attains truth.

Some have attempted to block the concern over the failure of scientific practices to yield hard truths by suggesting other ways in which truth applies to theory. Woleński (2017) has argued

[11] One potential difficulty for the proponent of approximate truth is that determining approximate truths seems to require antecedent knowledge of the truths against which they are approximated; otherwise, the approximation is an approximation to one-knows-not-what. Yet, antecedent knowledge of the truths against which approximate truths are measured seems to undercut the need for approximations in the first place.

against the view that Tarski's semantic conception of truth has no application to scientific theories, for example, and, hence, nothing to do with scientific realism. He has challenged this view by suggesting an alternative modern form of Tarski's semantic conception of truth, which he calls "the semantic definition of truth." The semantic definition of truth is based on the concept of a model where truth in a language, $\mathscr{L}$, a set of sentences, and a model, M, consists of the set of individual objects, U, subsets of U (set-theoretic counterparts of properties of objects), subsets of U x … x U (set-theoretical counterparts of n-termed relations defined by U), and, fixed individuals and functions. $\mathscr{L}$ and M are connected via a semantic interpretation, V, a function that ascribes truth-values to sentences of $\mathscr{L}$ and their constituents. Truth-in-$\mathscr{L}$-M can be defined in other semantic concepts, such as satisfaction, which deal with relations between expressions and objects. Suppose that P is a unary predicate and by definition refers to a subset of U. The formula Px is satisfied by an object, o, if and only if $o \in V(P)$, i.e., o is an element of the set being the value of P.

One challenge has recommended that we not apply Tarski's semantic conception of truth to scientific theories since we should apply the concept of partial or approximate truth. Wójcicki (1979; 1995a; 1995b), Psillos (1999), de Costa and French (2003), and Millgram (2009) have recommended that scientific truth is approximate or partial. Half-truths or 'the nearly true' may be captured by a semantic property. Woleński has recommended, however, that the proper Tarskian analysis of semantics does not allow for such approximations. Propositions are either true or false under a given interpretation, and there are no partial truths. He supposes that to take up the notion of approximate truth, one must relinquish classical logic in favour of many-valued, fuzzy, probabilistic, or revisionary logic and metalogic. There is no need, according to Woleński, to revise Tarski's semantic definition of truth.

Given that truth is necessary for knowledge on most views of (3), then, coupled with premises (1) and (2), it would seem to immediately follow that

∴ 4. Science never attains knowledge.

If science is the search for knowledge as in (1), then it seems that science is the search for something that it can never finally achieve. Hence,

∴ 5. Science is a futile search.

Obviously, the argument is not that scientists cannot discover any individual or local truths *p*, *q*, *r*, etc. Rather, the argument is aiming more at the kind of metaphysical realism of the sort decried by Rorty, Feyerabend, Goodman, Putnam, Lynch, and others.

Finally, the larger problem is that, to (5), one might append the premise that it is irrational to engage in futile searches, and then validly derive the conclusion that science itself is irrational. We ourselves do not necessarily endorse this conclusion, which is also a conclusion that surely would have also been rejected by members of the Lvov-Warsaw School and the Vienna Circle. But we do think it provides some pressure for exponents of these groups to develop the concept of rational cognition, and to do so in a way that addresses the Bergsonian irrationalist while making room to develop a proper conception of approximate truth.

4. Concluding Remarks

Members of the Lvov-Warsaw School (e.g., Ajdukiewicz, Dąmbska) and their intellectual offspring (Woleński) have offered an intellectually distinct alternative to the logical positivism of the Vienna Circle in logistic anti-irrationalism, a methodological rationalism that sought either to incorporate some form of explicit social justification (Ajdukiewicz) or to tease out the most hospitable form of rationalism by carefully analysing a tetrad of irrationalisms (Dąmbska). However, the Lvov-Warsaw School's attempt to critique the Franco-Germa currents of mysticism and romanticism in the late 19th and early 20th centuries, especially in the works of Henri Bergson, open it up to the question of whether its members fully appreciated the role of abstraction and approximate truth in scientific cognition. We have argued that the abstraction deemed a consequence of cognition's being rational also brings in tow a need to countenance approximate truth, which seems to put the

goal of knowledge out of reach. Whilst we believe that the consequences of these arguments have not been fully appreciated in the works of Ajdukiewicz, Dąmbska, or Woleński, we hope to have opened a new vein for research about the achievability of certain ambitious goals of the Lvov-Warsaw School's logisitic anti-irrationalism.

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