

Chapter 2

Leśniewski's Early Philosophical Views

Abstract I focus on Leśniewski's papers written before he published formal work on his systems. I begin with a discussion of what Leśniewski called *linguistic conventions*: various postulates introduced to elucidate the meaning and role of certain natural language devices. Then I show how he used them to draw conclusions about existential propositions, the principle of contradiction, the principle of excluded middle, the eternity of truth and the existence of abstract objects. I also explain his approach to paradoxes: Nelson–Grelling's, Meinong's, Epimenides' (the Liar), and Russell's. All Leśniewski's arguments are carefully reconstructed and critically assessed.

2.1 Introductory Remarks

It was not until the late 1920s that Leśniewski started publishing on the systems of logic for which he is famous. Before 1920, he devoted his papers to certain issues in the philosophy of logic and mathematics. However, most of his investigations from that time did not involve any formalized or axiomatized system. He conducted them informally.

Among the problems he discussed were the logical properties of existential propositions, the justification of the Principle of Contradiction, the value of the Principle of Excluded Middle, the eternity of truth, and a few paradoxes: Meinong's, Nelson–Grelling's, Epimenides' and, most importantly, Russell's.

Leśniewski in 1927 apparently repudiated his earlier results (1927, 181–182). Nevertheless, some of his arguments are interesting. Even if not all of them are philosophically compelling, they do cast some light on how his thought developed. Moreover, the reader has the right to assess these early views on his own instead of trusting Leśniewski's self-criticism.

I begin with a discussion of what Leśniewski called his linguistic conventions and I list the basic conventions that he accepted in years 1911–1914. Next, I show how he

applied those conventions to various problems. That is, I discuss what conclusions those conventions helped him to draw about existential propositions, the principle of contradiction, the principle of excluded middle, the eternity of truth, and how he attempted to solve a few paradoxes: Nelson–Grelling's, Meinong's, Epimenides' (the Liar), and Russell's. Finally I say a few words about his rejection of abstract objects.

2.2 Linguistic Conventions

Leśniewski's linguistic conventions are various restrictions he put on natural language to obtain its more regulated version. Those include definitions, which specify how he uses some terms, some general conditions on what the truth conditions of various types of statements are, and some other assumptions about the language of the discourse which are hard to classify.¹

Leśniewski claimed that if we rely only on common sense, it is hard to see any way out of paradoxes that arise in natural language (like the Liar, which arises when we ask ourselves whether “This sentence is false” is true or false). Commenting on his solution to the Liar (where he employed the assumption that no noun phrase token refers to any expression token of which it is a part) he explained:

It is also correct to say that the above-mentioned convention is ‘arbitrary’ in the sense that it conflicts with ‘natural intuitions’ of language. [...] Since, keeping to ‘natural intuitions’ of language we get involved in irresolvable paradoxes, these ‘intuitions’ seem to imply contradiction. The ‘artificial’ frame of strict conventions is thus a far better instrument of reason than the language dissolving in the opaque contours of ‘natural’ habits which often imply incurable contradictions—much as the ‘artificially’ regulated Panama Canal is a better waterway than the ‘natural’ rapids on the Dnieper. (1913b, 82)

Although he did not use the term ‘compositional’, one of his main worries about natural language was that in natural language the *symbolic function* (which is Leśniewski's idiosyncratic term for something like ‘reference’ or ‘semantic role’, read on for details) of a complex expression is not a straightforward result of the symbolic function of its components. In order to (1) avoid paradoxes that we run into when reasoning in natural language and (2) explain how the symbolic function of a complex expression results from the symbolic functions of its constituents (and the way they are related to each other in this complex expression) Leśniewski introduced some definitions and postulates which were supposed to regulate the language that he used. He called them *linguistic conventions*. Here is how he explained why they are needed:

The symbolic function of complex linguistic constructions, e.g., propositions, depends on the symbolic functions of the elements of these constructions, that is individual words, and on their mutual relationship. In the unplanned process of development of language,

¹ For instance, Tarski-style hierarchization of natural language seems to be a regimentation of the same sort.

the symbolic function of propositions can depend in some particular cases on identical symbolic functions and on identical relationship between specific words—in quite different ways. The planned construction of complex linguistic forms cannot, for representing various contents in the system of theoretical propositions, be confined within the possible results of the unplanned evolution of language. Such construction calls for the formation of certain general conventional-normative schemas to embody the dependence of the symbolic functions of propositions on the symbolic functions of their elements, and on the mutual relationship between these elements. To ascertain whether the given content has been represented adequately or inadequately in a proposition, one has to analyze individually how the speaker's representational intentions relate to the above-mentioned schemas. These schemas should indicate in what way the symbolic function of a proposition should be conditioned [determined R.U.] by the symbolic functions of the particular words and by their mutual relationship. (1911, 16–17)

And also:

I have more than once pointed out that a system of linguistic symbols, just as any other system of symbols, e.g., the system of railway signals, requires the existence of certain rules for constructing the symbols and keys for reading them.² I have repeatedly stressed that the functions of various complex linguistic structures, e.g., those of propositions, should depend, in a correctly constructed precise language, upon the functions or the order of particular words—on the basis of certain patterns determined by general normative conventions the knowledge of which permits the correct symbolization of an object in a given language or the decoding of a symbol for a given language. Taking into account the need so specified for a precise language, I established, in my previous papers, various linguistic conventions indicating on what rules the system of linguistic symbols is based and how to understand statements about some constructions which I used in analysis. (1913b, 56)

So, one reason for introducing conventions was to avoid paradoxes. Another one was that the trust we usually have in natural language intuition, though mainly sufficient for everyday communication, does not allow us to avoid ambiguities in more complicated cases and does not provide any method of resolving misunderstandings. Finally, he thought that conventions were needed to ensure the compositionality of symbolic function.

In his early work, Leśniewski did not codify those conventions in a manner typical for an axiomatic system. To a large extent, they are to be found here and there in his papers, sometimes introduced quite ad hoc in order to approach a specific problem. I will list and discuss those conventions in this section, and in the later sections I will show how Leśniewski applied them. Let us begin with some conventions from (1912, 31–42):

- (2.1) All expressions are divided into *connoting* and *non-connoting*.
- (2.2) An expression is connoting iff it can be defined.³

² Leśniewski's father was a railroad engineer.

³ "I divide all linguistic expressions into connoting and non-connoting; I adopt the expression 'connoting expression' to denote expressions that can be defined, and the expression 'non-connoting expression' to denote expressions that cannot be defined. The expressions 'man', 'green', 'square circle', 'centaur' are examples of connoting expressions; the expressions 'to a man', 'well', 'at', 'abracadabra', 'object', 'every man is mortal', etc. are examples of non-connoting expressions." (1911, 31)

Leśniewski, at least in the early period, seems to have followed Aristotle in his account of definitions.⁴ The way his train of thought develops indicates that 'can be defined' should be read as 'can be defined by means of a classic definition'. A classic definition has the form: '*A* is a *B* which is *C*'. Following Aristotle, *A* here is the defined expression, *B* is called the *genus proximum* (the closest kind) and *C* is a *differentia specifica* (specific difference). *C* has to somehow determine *B*, in the sense that either not every *B* should be *C*, or *C* should be a conjunction of more properties than *B*. Thus, for instance, 'square circle' is a connoting expression, for we can say 'A square circle is a circle which is a square'. In contrast, 'how are you' is not a connoting expression on this view, because for no *B* and *C* we can say: 'How are you is a *B* which is *C*'.

(2.3) All expressions divide into *denoting* and *non-denoting*. Denoting expressions are those which refer to (symbolize) something that exists, while non-denoting expressions are those that do not refer to any existing object. For example, the following expressions denote something: 'man', 'green', 'object', 'the fact that every man possesses the property of mortality', 'every man is mortal'. The relation of denoting is called a symbolic relation. An expression which denotes something is said to possess a symbolic function.⁵

(2.4) If an expression can be used and treated as having a symbolic function, it is said to have a *symbolic disposition*.

The distinction between having a symbolic function and having a symbolic disposition is the difference between actually referring and being able to refer without

⁴ The similarity between Leśniewski and Aristotle can be observed at least insofar as we speak of the form of a definition:

"Because there is nothing else in the definition
besides the primary genus and the differentiae." (Met., Z, 1037^b, 29–30) Aristotle's approach is more
metaphysically involved, because he attaches special status to (the closest kind)
and (specific differences). These notions are strongly connected
with his metaphysics.

⁵ "I divide all linguistic expressions into those denoting something and those denoting nothing, in other words symbolizing something and symbolizing nothing or expressions which are symbols and those which are not. I call the relation of expressions to the objects denoted (in other words—symbolized) by these expressions, a symbolic relation. I call that property of an expression which consists in its symbolizing something, the symbolic function of that expression. An expression which denotes something, or which possesses the symbolic function, can be exemplified by the following: 'man', 'green', 'object', 'the possessing by every man of the property of mortality', 'every man is mortal', etc. The expressions which do not denote anything, or do not possess symbolic functions, can be exemplified by the following ones: 'abracadabra', 'square circle', 'centaur', 'the possessing by every man of the property of immortality', 'every man is immortal', etc. The expression 'square circle' does not possess a symbolic function because no object is a square circle, in other words there is no such object as could be symbolized by the expression 'square circle'; thus the expression 'square circle' symbolizes no object, in other words symbolizes nothing. The expressions 'possessing by every man of the property of immortality', 'every man is immortal' do not possess a symbolic function because no man is immortal, in other words there is no object that could be symbolized by the aforementioned expressions. Therefore, these expressions symbolize no objects, or symbolize nothing." (1911, 31–32) It is interesting that among denoting expressions Leśniewski included true sentences, but not false sentences. He was not too explicit about what sentences refer to, but it seems that rather than accepting Fregean Truth, he rather took them to refer to facts or relations of inherence between objects and properties.

any change on the part of the language.⁶ Empty names and false sentences have a symbolic disposition but not a symbolic function. Names referring to objects and true sentences have both.⁷

(2.5) Connoting expressions having symbolic function divide into expressions for which there is a non-connoting expression which symbolizes the same object, and expressions for which there is no such non-connoting expression. For instance, the expression 'the fact that every man is mortal' denotes the fact that every man is mortal. There is a corresponding non-connoting expression: 'every man is mortal', which denotes the same fact. By contrast, for the connoting expression 'cow' there is no non-connoting expression denoting the same object(s).

(2.6) Accordingly, connoting expressions possessing a symbolic disposition divide into expressions for which there is a non-connoting expressions having the same symbolic disposition, and those for which there is no such connoting expression.⁸

(2.7) Non-connoting expressions for which there is a connoting expression having the same symbolic disposition are called *propositions*. (1911, 34)⁹

(2.8) A proposition is true iff it possesses a symbolic function. Otherwise, it is false. (1911, 34–35)

(2.9) A simple affirmative proposition (that is, a proposition not having a proposition as its proper part) is of the form '*S is P*' and it symbolizes the relation of inference between the object denoted by the subject and the properties connoted by the predicate. An atomic proposition is true if and only if the object denoted by the subject has all the properties connoted by the predicate.¹⁰

⁶ I add this reservation, because Leśniewski wouldn't say that, for instance, 'how are you' has a symbolic disposition just because someone can use this phrase to name an elephant.

⁷ "I call the property of an expression which consists in that expression's application or treatment (according to, or against, the adopted linguistic conventions) as one possessing the symbolic function, the symbolic disposition of that expression. Thus, e.g., I say that the expressions: 'man', 'hippocentaur', 'every man is mortal', 'the possessing by a hippocentaur of the property of horseness'—possess a symbolic disposition when they are applied, or treated as expression-symbols. The first and third of these expressions possess a symbolic function, but the second and fourth do not because no object is a hippocentaur or the possession by a hippocentaur of the property of horseness." (1911, 33)

⁸ "All connoting expressions possessing a symbolic function can be divided into two groups: expressions which correspond with any non-connoting expression symbolizing the same object, and expressions which correspond with no non-connoting expression symbolizing the same object. Thus, e.g., the connoting expression 'the possessing by every man of the property of mortality' corresponds with a non-connoting expression symbolizing the same object, namely the expression 'every man is mortal'. The latter also symbolizes the possessing by every man of the property of mortality and also the expression 'the possessing by every man of the property of mortality'. Whereas the connoting expression 'man' corresponds with no non-connoting expression which would symbolize the same objects as those symbolized by the word 'man'.

All connoting expressions possessing a symbolic disposition can be divided into two groups: expressions which correspond to any non-connoting expression possessing the same symbolic disposition, and expressions which correspond to no such non-connoting expression." (1911, 34)

⁹ Whenever I refer to someone's work, it is my reading of the text, unless quotation marks are present.

¹⁰ "...any proposition possessing a symbolic function symbolizes the possessing by the object, symbolized by the subject of that proposition, of properties connoted by its predicate. This convention

(2.10) "A proposition having a denoting subject and a connoting predicate possesses a symbolic function iff¹¹ a singular proposition being its contradictory counterpart does not possess the symbolic function." (1911, 36)

It seems that by 'the relation of inherence between an object and a property' Leśniewski does not mean one and the same relation for all true simple sentences. Rather, he means something like "relation tokens". For him, whenever we have two true atomic sentences such that either their subjects symbolize different objects or the predicates symbolize different properties, the relations of inherence involved are numerically different.

(2.11) "No contradictory proposition possesses a symbolic function."¹² (1911, 36)

(2.12) "If one of two propositions contradicting each other possesses a symbolic function, then the other will not possess one." (1911, 36)

(2.13) A proposition is *true a priori* iff its truth can be demonstrated by means of linguistic conventions alone. It is *false a priori* iff its falsehood can be demonstrated by means of linguistic conventions alone.¹³ (1911, 36)

Now, a few conventions to be found elsewhere:

(2.14) "[A] connoting expression *W* represents any object possessing the properties connoted by the expression '*W*'—with the exception of the expression '*W*' itself together with those expressions which have at least one element in common with the expression '*W*'." (1913b, 64)

Leśniewski was a nominalist (I discuss his argument against universals later on). The above convention about what connoting expressions denote is to be understood as being about what nowadays we would call tokens: utterances and inscriptions. As we will see Sect. (2.8.3), he relied on this move in his response to the Liar paradox.

(Footnote 10 continued)

implies that propositions can symbolize only the relations of inherence." (1911, 36) What is somewhat interesting, Leśniewski, instead of saying that this refers only to simple (atomic) propositions adds a footnote which says: "...I speak of propositions in the sense of the ones reduced to the form of categorical propositions with positive copulas and predicates in the Nominative." (1911, 36) which seems to suggest the claim that all propositions are reducible to propositions of this specific form. This claim however is not essential for further discussion; neither does Leśniewski give a complete set of directions describing how this reduction should proceed for any arbitrary proposition. Therefore, I decided to treat (2.9) as referring to simple propositions only, without assuming the claim about the reducibility of complex propositions (which is implausible anyway).

¹¹ Leśniewski in his early writings used 'if' in definitions in the sense of 'iff'.

¹² Some conventions I just quote, if they were originally phrased in a concise manner. If I find a simpler and more accessible reformulation, I use it instead.

¹³ Probably 'alone' should be read as 'as the only extralogical assumptions.' "I call false *a priori* all such propositions whose falseness can be demonstrated by means of linguistic conventions alone or the propositions which can be inferred from those conventions. ...On the analogy of the definition of the expression 'proposition false *a priori*', I define the expression 'proposition true *a priori*'. I employ the latter expression to denote such propositions whose validity can be demonstrated by means of linguistic conventions alone or the propositions which can be inferred from these conventions."

(2.15) A simple affirmative proposition is *analytic* iff it contains no predicates which connote properties that are not connoted by the subject. It is *synthetic* if it contains predicates which connote (also) such a property (properties) that are not connoted by the subject.

Here is how Leśniewski phrased the distinction:

I use the expression ‘analytic proposition’ to denote propositions which, being of the form of propositions with positive copulas, contain no predicates which connote properties that are not connoted by the subject. I use the expression ‘synthetic proposition’ to denote those propositions which, being of the form of propositions with positive copulas, contain predicates which connote also such properties that are not connoted by the subject. Thus, e.g., the propositions ‘a man has two hands’, ‘an orphan does not have a mother’ are analytic if we use the word ‘man’ in the sense of ‘mammal with two hands and two legs’, and the word ‘orphan’ in the sense of ‘human being that has neither father nor mother’; it is because the properties connoted by the predicates of the propositions with positive copulas—‘man is what has two hands’ and ‘an orphan is what does not have a mother’—that is the properties of having two hands and not having a mother—are connoted by the subjects: ‘man’ and ‘orphan’. The propositions: ‘man creates God in his own likeness’ or ‘an orphan never knows a caress in his life’, on the other hand, are synthetic because the properties connoted by the predicates of the propositions with positive copulas: ‘man is what creates God to his own likeness’ and ‘an orphan is what does not know a caress in its life’, that is the properties of creating God to one’s own likeness and of not knowing a caress in one’s life, are not connoted by the subjects. (1911, 2–3)

(2.16) A proposition with a negative copula (‘is not’) reduces to a proposition with the same subject, positive copula and a predicate generated by preceding the predicate of the previous sentence by ‘non’, e.g. ‘*S* is not a *P*’ reduces to ‘*S* is a non-*P*.’¹⁴

Leśniewski also introduced a convention about proper names which, although not used afterwards, is interesting in itself:

(2.17) Proper names connote the property of possessing a name which sounds like a given proper name. Proper names denote different objects univocally. For example ‘James’ denotes every James in the same sense (as far as there is more than one person called ‘James’).

Since Leśniewski’s views on proper names are quite uncommon we will take a closer look at this view in Sect. 2.3.

2.3 A Digression on Proper Names

Let us start with Leśniewski’s formulation of the view expressed in (2.17):

¹⁴ “...a proposition with a negative copula can symbolize possessing, by the object denoted by the subject of that proposition, properties connoted by the expression consisting of the word ‘not’ and the predicate of the proposition with a negative copula in question (the negation ‘not’ is to apply to the whole expression that follows it). If the proposition with a negative copula has the form: ‘no etc ...’, then the word ‘no’ will be substituted, in the process of reduction, by the word ‘every’. Thus the proposition with a negative copula ‘no object can both possess and not possess one and the same property’ ...symbolizes the possessing by the object denoted by the subject of that sentences ...the possessing by every object of properties connoted by the expression consisting of the word ‘not’ and the predicate of the proposition with a negative copula—that is, the expression ‘able to both possess and not possess one and the same property’.” (1912, 23)

J.S. Mill says that not all names have connotations. Among those which have no connotations are, according to Mill, proper names such as, e.g., Paul, Caesar on the one hand, and some of the names of attributes on the other. If this were really so, one could foresee certain difficulties in regarding as analytic those positive existential propositions whose subjects are just such names without connotation. Yet even the names which I have mentioned and which according to Mill have no connotation, in my opinion, have connotation; proper names connote the property of possessing a name which sounds like the given proper name, whereas the names of attributes regarded by Mill as lacking connotation, connote either the property of possessing such names, or the property of complete identity with entities which bear such names. Thus, e.g., the name 'Paul' connotes the property of having the name 'Paul', the name 'redness' connotes the property of having the name 'redness'. Instead of 'Paul' we can then say 'a being which has the name 'Paul'', instead of 'redness'—a being which is completely identical with beings that bear the name 'redness'...I shall touch here upon Husserl's thesis that one proper name, e.g., Socrates', can name various objects only because it is ambiguous, just as names such as 'redness'; I do not think this is the case—these names would be equivocal only if, while denoting various objects, they also connoted different properties. In fact the word 'Socrates', while denoting different objects, connotes always one property, that is the property of bearing the name 'Socrates'. [translation slightly corrected R.U.] (1911, 5–6)

This view is not just merely a descriptive theory of proper names. The descriptive theory postulates that for any proper name there is a definite description which uniquely determines its reference. This already assumes that proper names, taken univocally, pick out their referents uniquely. On the other hand, Leśniewski suggested that proper names are not only connotative (as Russell or Frege may be read to have suggested), but also that they are, in a sense, general terms. There are at least three controversial claims about proper names that Leśniewski seems to have been committed to:

(2.18) For any proper name n it is possible that there are at least two different objects, o_1 and o_2 such that if terms n_1 and n_2 refer uniquely to o_1 and o_2 respectively, then both ' n_1 is n ' and ' n_2 is n ' are true.

(2.19) For any object o , o is a referent of a proper name n iff o has a property of being named by n .

(2.20) The property described in (2.19) is the only property connoted by n .

One might object to (2.18) by saying that whenever we use a proper name, we seem to (or at least we are trying to) refer to a unique object. One can also argue against (2.19) by insisting that it's *prima facie* implausible if we apply possible-world semantics. For indeed, take the name 'Aristotle'. It seems that Aristotle could have been named with a different proper name than the name which he actually was given. Thus, there appears to be a possible world where Aristotle does not possess the property of being named 'Aristotle'.¹⁵ (2.20) seems suspicious because it seems circular: to know what n refers to, I have to know what property it connotes. Yet, to know which object has the property connoted by n I already have to know which object is named by n , and therefore which object n refers to.

¹⁵ See (Kripke 1980) regarding related issues.

The objections are not conclusive, though. The fact that whenever we use a noun phrase m we tend to refer to a unique object does not entail that it is not possible that m has more than one referent. This is pretty straightforward and does not require additional arguments. Note also that there are some terms which are general, but which are in the majority of their uses taken as referring to exactly one object (like ‘father’ or ‘mother’). That is, what a term in one of its uses is taken to refer to is not fixed by its connotation only, but also by pragmatic considerations.

Second, proper names in some rare uses are taken to refer to multiple objects. For instance, if a superstitious parapsychologist who believes in “the power of names” says ‘Jacob is always impolite’ she does not have to refer to any specific person. Rather, she might be understood as saying ‘Everyone whose name is ‘Jacob’ is impolite’. Or, she may say ‘Every Jacob is impolite’, which seems to be a normal case of quantification and, unless some other reasons against this reading are given, can be treated as such.

It is also sometimes admissible (however uncommon) to use a plural form of a proper name to refer to a few bearers of this name simultaneously. One of languages in which this happens is Polish. For example, if there are two men, each of them being named ‘Rafal’, you might say (in Polish): ‘The Rafals went to the store’ if it is clear from the context that those two men are the only Rafals you might be referring to.

The objection against (2.19) is not really lethal either. What it indicates, though, is that (2.19) has to be reformulated. Although the example mentioned in the objection may falsify (2.19) in one of its readings, consider the following intuitive emendation:

(2.21) For any object o , o is a referent of a proper name n (in a language L) iff n has the property of being named by n (in L).

where by ‘being named’ we speak of some sort of procedure typical for the way proper names are introduced in a given language.

It is true that the object named ‘Aristotle’ (in English) in the actual world in another possible world is not named ‘Aristotle’ in any of the languages existing in that possible world. Still, it is true about Aristotle in such possible world that his name is ‘Aristotle’ in actual English. This indicates that the connotations of proper names on Leśniewski’s view are better to be interpreted as not purely descriptive, for the reference to the actual language to which the proper name belongs is rigid.

A more serious concern comes to mind when we ask ourselves how informative (2.17) really is and we doubt whether (2.20) is not circular. Its main claim is that “proper names connote the property of possessing a name which sounds like a given proper name.” If this is supposed to explain how names refer, it does not do much more than saying:

[PNA] A proper name denotes the object(s) having the property of being denoted by it.

or

[PNB] The sense of a proper name n (in L) is ‘an object denoted by n (in L)’.

On the face of it, both options are problematic. [PNA] is uninformative: it uses the notion of denotation of a proper name to explain what a proper name denotes. [PNB] in an explanation of what sense of a proper name is uses the notion of denotation of a proper name, thus blocking the possibility of using the sense of a name in explaining what it denotes.

Perhaps there are viable ways of facing these challenges. Maybe the notion of denotation on the right-hand side of [PNA] differs from the one on the left-hand side. Maybe an interesting interplay of the notions of sense and (various definitions of) denotation can be developed to show [PNB] says something philosophically plausible. Alas, Leśniewski did not get into any more detail and never returned to the issue.

This sort of approach, dubbed *nominal description theory* of proper names, have been developed in more detail recently by Kent Bach. Bach, most likely independently of Leśniewski, formulated the view on which “when a proper name occurs in a sentence it expresses no substantive property but merely the property of bearing that very name.” (Bach 2002, 73).¹⁶ Alas, a longer discussion of Bach's views lies beyond the scope of this book. Let us get back to Leśniewski and his account of existential propositions.

2.4 Existential Propositions

Leśniewski's first publication (1911) was concerned with the properties of existential propositions. This is also the first time he applied his conventions. His claims in that paper were somewhat unusual. On his view, all positive existential propositions are analytic and yet false. Also, some negative existential propositions are analytic and false and some are synthetic, but contradictory and therefore false.

For Leśniewski all existential propositions are atomic. A positive existential proposition is of the form: ‘*S* exists’ or equivalently: ‘*S* is a being’ (1911, 3). A negative existential proposition has the form: ‘*S* does not exist’ or ‘*S* is not a being’ where ‘being’ is a noun phrase meaning the same as Latin *ens*, Greek *on*, or English *object*.

Following convention (2.1) we know that ‘being’ connotes something only if it can be defined by means of a classic definition. However, to form such a definition, we would have to find such *B* and *C* that:

$$(2.22) \quad [A] \text{ being is a } B \text{ which is } C.$$

would be a classic definition. To make such a definition work, *B* would have to be a name wider than ‘being’. However, (and that is another concept taken from Aristotle)

¹⁶ See also (Katz 1990).

there is no name wider than ‘being’ or ‘object’. Everything that can be named is an object, and as such, a being of some sort.¹⁷

Thus, on Leśniewski’s view, there is no definition of ‘being’, and the name ‘being’ does not connote anything. This, together with convention (2.15) entails:

(2.23) All positive existential propositions are analytic.

Recall that according to (2.15) a positive atomic proposition is analytic if and only if its predicate does not connote properties which are not connoted by the subject. Since ‘being’ does not connote anything, whatever is the subject of a positive existential proposition, its predicate does not connote anything which is not connoted by the subject. At least, this is Leśniewski’s argument for this claim.

Nevertheless, every positive existential proposition is, according to Leśniewski, false. His argument is based on convention (2.9). Indeed, ‘*S* is a being’ is true iff *S* has all properties connoted by ‘being’. But, since there are no such properties, it is false that *S* has them. (The fact that Leśniewski thought this argument sound indicates that he treated a sentence of the form ‘all *A* are *B*’ as implying the existence of some *A*’s. If, instead, (2.9) was read as saying that it is true iff no properties connoted by the predicate are not had by the object(s) denoted by the subject, the argument would not go through.)

Now consider negative existential propositions. There are two options. A negative existential proposition is either analytic or it is synthetic.

If ‘*S*’ itself connotes the property of non-being, then ‘*S* is a non-being’ is analytic, and yet false. According to Leśniewski, atomic propositions with contradictory subjects are contradictory themselves, and cannot be true (2.11).

If ‘*S*’ does not connote the property of non-being, ‘*S* is a non-being’ is synthetic and *S* is only said to have the property of non-being. But every ‘*S*’ is reducible to a name phrase ‘being which has properties A_1, A_2, A_3, \dots ’. So we have a proposition saying something equivalent to:

The being which has properties A_1, A_2, A_3, \dots , is not a being.

which is a contradictory proposition.

Leśniewski’s conclusions are unusual. He defended his claims despite their lack of intuitive support. So, first, it might be objected that the definitions that he uses in proving his conclusions are artificial. For Leśniewski, the relevance of a classification

¹⁷ “I have said that the predicate of a positive existential proposition which has been brought to the form of a proposition with a positive copula, does not connote anything, except—at most—the property of being greater than one. I maintain this because such a predicate is synonymous with the words ‘being’ or ‘beings’ which connote nothing else, even though they denote (‘denotation’ as used by Mill) everything. This view conflicts with J.S. Mill’s theory which says the word ‘being’ connotes the property of existing. I consider Mill’s theory wrong because, should the word ‘being’ really connote the property of existing, we could define that word as ‘that which has the property of existing’, or in other words, as a ‘being which has the property of existing’ (since the definition must indicate not only *differentiae specificeae*, but also the *genus*); this would, then, give rise to an inevitable *regressus in infinitum*. The word ‘being’ cannot be in fact defined at all; the statement that this word does not connote anything is fully in keeping with this fact.” (1911, 4–5)

depends on its theoretical usefulness, that is, on whether it allows us either to construct propositions or theories concerning all and only those objects which fall under one of the classes that our classification singles out. And indeed, he thought that his classification makes it easier to put forward some theoretical claims about all and only (simple) analytic propositions and other claims concerning all and only (simple) synthetic propositions. Some examples that Leśniewski gave were: 'All analytic propositions (and only these propositions) contain no such information about the objects symbolized by the subjects, that could not be deduced from the meaning of the subjects' and 'All synthetic propositions (and only these propositions) contain such information about the objects symbolized by the subjects' (1911, 9–10).¹⁸

One might think, all Leśniewski did is he introduced a few definitions which, together with some assumptions about how the language works, implied some bizarre claims. They sound awkward because the terms employed mean something different from what we usually associate with those terms. Leśniewski, however, treated his conclusions as if they actually held for natural language. Here is what he says about that:

The idea expressed in the preceding section contradicts current opinions concerning existential propositions: the possibility of constructing both positive and negative, true existential propositions is commonly accepted. Thus e.g., both the proposition 'people exist' and the proposition 'square circles do not exist' are considered true.

I have taken pains to demonstrate the groundlessness of this common attitude towards existential propositions, all that remains for me to do is to cast some light on the probable origin of such a **widespread error**. [emphasis mine] (1911, 15)

He also suggested that his views about analytic propositions were claims about the same group of propositions which was referred to by other logicians and philosophers:

¹⁸ About the idea that some classifications are natural and some are artificial he says: "One hears, from time to time, of 'natural' and 'artificial' methods of classification. People who use this form of expression do not usually limit themselves in characterizing particular methods of classification, to the inclusion of these descriptively to either of the above categories; they usually combine such a descriptive characterization of methods of classification with the teleological element of valuation, and they value 'natural' classifications higher than artificial' ones. The origins of the above characterizations of methods of classification, and the positive or negative estimations which accompany these characterizations, can vary immensely from case to case.

Some such cases are determined by various linguistic habits and traditions, others—by more or less well thought out and justified views concerning the problems of theoretical usefulness.

The classification of propositions into analytic and synthetic which I have carried out ... can be, in view of at least one of its consequences, characterized as regarded by some as 'artificial'. Such an 'objection' can in the first place originate from the fact that one of the two classification labels, i.e., that of analytic propositions, comprises two 'very' or 'too' heterogeneous groups of propositions: (1) propositions whose predicates connote any properties but not those connoted by the subjects', and (2) propositions whose predicates do not connote the properties connoted by the subjects only because they do not connote any features.

I do not consider it my task to tone down all such dissonances if they arise solely from deeply rooted emotional impulses resulting from some linguistic habits, yet I cannot miss the opportunity to provide my classification of propositions with a 'safety valve' against objections supported by arguments of theoretical usefulness of my classification." (1911, 9)

In modern logic there is a widespread conviction that all analytic propositions are true. Those who advocate such a privileged position of analytic propositions in science claim that the principle of contradiction would be in jeopardy if any proposition could be false in spite of its being analytic [...But] some analytic propositions might be true, while others might be false. [...] Thus, those scholars who hold that all analytic propositions are necessarily true propositions are in error. (1913b, 61–62)

A more moderate conclusion to draw would be that one can take the Kantian definition of analyticity as inclusion of the subject in the predicate quite literally, and that with the aid of Leśniewski's other assumptions, one can argue that this definition does not coincide with the notion of 'being true in virtue of meaning'.¹⁹

Anyway, Leśniewski goes on to point out that sentences that seem to be true and existential are misrepresented and their "adequate verbal symbols would be non-existential propositions" (1911, 15), that is, instead of '*S* exist(s)', if we take it to be true, we should use 'Some being(s) is(/are) *S*' and by '*S* does not exist' we should use 'No being(s) is(/are) *S*', if we want to represent our beliefs and intentions adequately. His explanation of how he got to this conclusions is somewhat hasty:

The semiotic analysis of the adequacy or inadequacy of certain propositions in relation to the contents which they represent is then ultimately based on a phenomenological analysis of the speaker's representational intentions. (1911, 17)

There is something specific to note about his arguments. His reasoning for the claim that all positive existential propositions are analytic assumes that 'being' does not connote anything (for it is not definable by means of a classic definition). On the other hand, his justification of the claim that negative propositions are false assumes that 'non-being' connotes something. It is far from obvious that by negating a predicate which does not connote something one can get a predicate connoting something.

Arguably, for 'non-being' one cannot construct a classic definition either. For consider:

A non-being is a *B* which is *C*.

We cannot find *B* and *C* to make the above expression true, because (as Leśniewski himself seems to have believed), the truth of the claim that *B* is *C* in a definition requires a *B* which is *C* to exist. A possible objection to this claim is this. It is possible to take any two disjoint *B* and *C* in order to obtain such a definition. The problem with this objection is that Leśniewski used the notion of a classic definition: *B* has to be a *genus proximum* and *C* has to be a *differentia specifica*. That is, *C* has to be included in *B*. Obviously this would be impossible had *B* and *C* been disjoint.

Leśniewski appears to make two of the standard moves that were usually made those days. (1) He suggested that the surface form of a statement does not have to express its content adequately. (2) He used quantificational devices to express existence.

¹⁹ For the sake of simplicity, I am putting well-known general concerns about the notion of analyticity aside. See however (Russell 2008) for a defence of analyticity.

Although (1) seems to be a correct observation, Leśniewski does not seem to have been influenced by a similar strategy of Russell's or Frege's. Probably, the extent to which he was acquainted with the western logical thought at that time did not exceed a relatively simple formal theory given by Łukasiewicz in his book on the principle of contradiction (Łukasiewicz 1910).

As to (2), it is unclear which part of Leśniewski's 'Some object is S' does the heavy lifting of existential import. In his early work, Leśniewski was unclear about that. Later on, however, it was the copula 'is' that imported the existence rather than the quantifier.²⁰

Leśniewski's general line is this. First, he introduced linguistic conventions and agreed that they do not merely formalize our natural language intuitions. Rather, they are, to some extent, supposed to replace intuitions whose reliability is undermined by paradoxes. Then, he argued that given those conventions it follows that existential propositions do not have certain properties we normally think they do (and that people who share the normal intuitions are wrong). Next, he insisted that to preserve those "normal" intuitions we have to use different sentences to express what we have in mind.

It is not clear why Leśniewski went through all the trouble of playing around with the 'unnatural' reading and insisting that we should change our ways of expressing existential statements in natural language. Perhaps a more viable option would be to say that the logical structure of existential statements is not the one Leśniewski initially attributes to them, but rather the one he introduces to preserve our intuitions about existential statements. The notion of deep logical structure of a natural language sentence, it seems, was not available to Leśniewski at that time, and this might be one reason why he expressed his view as he did. On this re-interpretation, the lengthy discussion of the unnatural reading might be seen as an argument against that interpretation and for the more elaborate quantificational reading of existential statements.

2.5 The Principle of Contradiction

In 1910, Łukasiewicz published a book titled *On the Principle of Contradiction in Aristotle* (Łukasiewicz 1910a)²¹ His considerations of Aristotle's position led him to distinguishing at least three different principles: the logical principle of contradiction,

(2.24) For no p : p and $\text{not} - p$ are true simultaneously.

the ontological principle of contradiction,

(2.25) No being may possess and not possess at the same time one and the same quality.

²⁰ So, for example, it is a theorem of one of Leśniewski's systems that $\exists a \neg ex(a)$, i.e. 'For some a , a does not exist'.

²¹ For a short explanation of the confusion surrounding Łukasiewicz's works on contradiction, see footnote 7 in Chap. 1. For a wider historical context see Betti (2004b).

and the doxastic principle of contradiction.

(2.26) It is not possible to believe in a contradiction.

He argued that (2.26) as a factual statement is false (although it may have some worth as a methodological directive), and that Aristotle's arguments for (2.24) and (2.25) are not conclusive.

In his paper from 1912, Leśniewski, against Łukasiewicz, attempted a proof of the (ontological) principle of contradiction. The basic version in which he formulated that principle was:

(2.27) No being can both possess and not possess one and the same property.

Which was also equivalently stated as:

(2.28) Every object is unable to both possess and not possess one and the same property.

(2.29) Every P is unable to both have and not have c .

The expression 'both to possess and not to possess a property c ' Leśniewski abbreviated as 'to be a contradiction'. The expression ' P is unable to be a contradiction' was read by Leśniewski as equivalent to a conjunction of two claims:

(2.30) P is not a contradiction.

(2.31) The sentence ' P is not a contradiction' is true *a priori*.

where being true *a priori*, by convention (2.13), means being provable on the basis of linguistic conventions only.

Leśniewski's argument for the Principle of Contradiction goes as follows:

(2.32) 'Some object is a contradiction' is a contradictory proposition.

By (2.11), 'Some object is a contradiction' does not possess a symbolic function (because (2.11) says that no contradictory proposition possesses a symbolic function). However, it has (he claimed) a denoting subject and a connoting predicate. Therefore, by the convention regarding the truth and falsehood of contradicting propositions with denoting subjects and connoting predicates (2.10), the proposition:

(2.33) Every object is not a contradiction.

is true (because its contradictory proposition is false). Since the proof is based on linguistic conventions only, the Principle of Contradiction is, according to Leśniewski, true *a priori*.

Clearly, in some reasonable sense of the word 'proof', what Leśniewski gave was a proof of the ontological Principle of Contradiction. Nevertheless, epistemically speaking the proof is not extremely compelling. The conventions on which it is based, especially the one which says that no contradictory proposition possesses a symbolic function, seem to do the heavy lifting and to smuggle the conclusion in already. If someone rejects the ontological Principle of Contradiction, they probably

will not accept the claim that contradictory propositions do not have a symbolic function.

Given that the argument is not too convincing, it is interesting to see how Łukasiewicz reacted to Leśniewski's paper. Here is a passage from Łukasiewicz's entry in his diary from May 9, 1949²²:

I met Leśniewski in Lvov in 1912. I lived then with my uncle in Chmielowski Street 10. One afternoon someone rang at the entrance door. I opened the door and I saw a young man with a light, sharp beard, a hat with a wide brim and a big black cockade instead of a tie. The young man bowed and asked kindly: "Does Professor Łukasiewicz live here?" I replied that it was so. "Are you Professor Łukasiewicz?" asked the stranger. I replied that it was so. "I am Leśniewski, and I have come to show you the proofs of an article I have written against you". I invited the man into my room. It turned out that Leśniewski was publishing in *Przegląd Filozoficzny* [Philosophical Review, RU] an article containing criticism of some views of mine in the "Principle of Contradiction in Aristotle". This criticism was written with such scientific exactness, that I could not find any points which I could take up with him. I remember that when, after hours of discussion, Leśniewski parted from me, I went out as usual to the *Kawiarnia Szkocka* (Scottish Café), and I declared to my colleagues waiting there that I would have to give up my logical interests. A firm had sprung up whose competition I was not able to face.

2.6 The Principle of Excluded Middle

Leśniewski (1913b) makes a distinction between two formulations of the Principle of Excluded Middle (PEM). One refers to objects (the metaphysical PEM):

(2.34) Every object has to stand, with respect to every property, either in the relation of possessing it or in the relation of not possessing it.

the second refers to propositions (logical PEM):

(2.35) At least one of two contradictory propositions has to be true.²³

He clearly states that his rejection of PEM will be the rejection of the logical version. He speaks of this version of PEM in not very favorable terms:

The logical principle of the excluded middle not only does not help to resolve 'logical' problems of various kinds, but it is in fact a dangerous theoretical obstacle which should be, therefore, removed from science. (1913b, 47)

The argument against the logical version of PEM proceeds as follows. According to convention (2.9), for an atomic proposition of the kind ' A is B ' to be true, there must

²² The diary is unpublished. The translation from Polish is due to Owen LeBlanc and Arianna Betti. Accessed on August 31, 2010 at <http://www.segr-did2.fmag.unict.it/polphil/PolPhil///Lesnie/LesnieDoc.html#lukdiary>

²³ Although Leśniewski did not give a definition of the contradictory of a sentence, from his discussion it seems that this was a syntactic notion: if S is taken to be a singular term, the sentence contradictory with ' S is P ' would be ' S is not P ', and if S is taken to be a general term, then the sentence contradictory to ' $\text{Some } S \text{ is } P$ ' is ' $\text{Every } S \text{ is not } P$ '.

be an object denoted by A , having all the properties connoted by B (recall that the reading of ‘all properties’ is strong here, so: ‘all properties and at least one property’). Hence, every atomic proposition whose subject does not denote anything is a false proposition, and every proposition whose predicate does not connote anything is a false proposition.

Thus, all contradictory sentences from the following pairs are false:

(2.36) Every centaur has a tail. Some centaur does not have a tail.

(2.37) Every square circle is a circle. Some square circle is not a circle.

(2.38) Pegasus is an animal. Pegasus is not an animal.

The first two examples come from Leśniewski, the last one does not.²⁴ Since these pairs are, according to Leśniewski, pairs of contradictory propositions, they are counterexamples to PEM.

Thus, Leśniewski rejects the equivalence:

(2.39) (A is B ’ is false) \equiv (A is not B)²⁵

Moreover, this account yields some specific examples of false analytic sentences:

(2.40) Every contradictory object is contradictory.

(2.41) A square circle is a circle.

Note that according to Leśniewski, the proposition contradictory to ‘ S is P ’ is ‘ S is not a P ’, which is not equivalent to ‘It is not the case that S is P .’ To some extent it allows one to think that his discussion is not a discussion of propositional Principle of Excluded Middle proper, because the negation involved is different. Yet, we will later see that the issues discussed in the 1914 paper will be important for his

²⁴ “Let us suppose that I am to answer the question of whether the following propositions are true: ‘every centaur has a tail’, ‘a certain centaur does not have a tail’, ‘every square circle is a circle’, ‘a certain square circle is not a circle’. If we take into account the above analysis, the answer to this question becomes quite easy. Each of the four mentioned propositions is obviously false because the subject of each denotes nothing. The word ‘centaur’ which is the subject in the first two propositions, and the expression ‘square circle’ being the subject in the remaining two—denote nothing because no object is a centaur and no object is a square circle. Thus, no object is such that it could be denoted only by the word ‘centaur’ or by the expression ‘square circle’. These expressions denote no objects, that is to say—they denote nothing.” (1913b, 59)

²⁵ “The points raised ... throw some light on the ‘problem’ of negative propositions. They demonstrate the falsehood of the theory of negative propositions, developed in considerable detail by Sigwart in his *Logic* and defended by some other modern logicians. According to this theory—the negative proposition ‘ A is not B ’ is equivalent to the affirmative proposition ‘the proposition ‘ A is B ’ is false’ ... Given the propositions ‘the centaur has no tail’, ‘a square circle is not a circle’ ... the respective propositions ... are ‘the proposition ‘the centaur has a tail’ is false’ and ‘the proposition ‘the square circle is a circle’ is false’. The propositions of the type ‘ A is not B ’ ... are in this case false because ... they have subjects which denote nothing ... For the same reason, the respective propositions of the type ‘ A is B ’, i.e. ‘the centaur has a tail’, ‘a square circle is a circle’—are also false. If, however, the last two propositions are false, then the propositions stating their falsehood must be true.” (1913b, 59–60)

logical development further on (for example, for Leśniewski's solution of Russell's paradox).

Also, Leśniewski's considerations allow us to see the difference between the metaphysical PEM and the logical PEM. Leśniewski's rejection of logical PEM does not undermine the metaphysical version. Leśniewski still claimed that any existing object either has or does not have a given property. The only case where he thought the logical PEM might fail is when a subject of a sentence fails to denote.²⁶

2.7 Eternity of Truth

Leśniewski believed that any sentence that was true is and will be true, and that any sentence that was false is and will be false. In this sense, he believed in the eternity of truth. Most of his views on this issue can be found in a paper which he wrote to criticize Tadeusz Kotarbiński, who believed that there are some sentences which are neither true nor false and may become true or false with the flow of time. The whole discussion between Kotarbiński and Leśniewski was seminal for Łukasiewicz's invention of three-valued logics. What Łukasiewicz rejected was the claim that if a sentence is not true, it is false. Thus, he introduced a third value, interpreted as 'not yet determined'.²⁷

Since Kotarbiński's views are quite important for the development of many-valued logics (his views inspired Łukasiewicz to construct his three-valued logic) and Kotarbiński's paper has never been translated from Polish, I will start with a lengthy presentation of Kotarbiński's views. Then I will turn to Leśniewski's criticism of those views.

In (1913) Tadeusz Kotarbiński, a representative of the Lvov-Warsaw school, published a paper titled "The problem of the existence of the future." His main claim is that propositions about future events not yet causally determined are neither false nor true now. The arguments are rather unclear and the paper employs many metaphors. The main gist, however, is that if propositions do not change their truth-value through time, then all actions are predetermined and there is no free will (and since we know we have free will, propositions change their truth-value through time). Here is a sample of Kotarbiński's style in that paper:

Truly one has said that what has gone away has never ceased to exist—it only came into absence. What happened, truly happened; one who states that, states the truth, so this some-

²⁶ Even though Leśniewski rejected one of the forms of the PEM, he did not divide sentences into true, false and indeterminate—according to him, if a PEM failure takes place, it is because both a sentence and its negation are false. Gelber (2004) suggested that "on the basis of his interpretation of Aristotle, for instance, Leśniewski developed a three-valued classification with true, false and indeterminate as the values" (p. 231). This is not Leśniewski's view. The charitable reading of Gelber is that Leśniewski is there mistaken with Łukasiewicz).

²⁷ The introduction of such a third value would invalidate Leśniewski's reasoning. There are some other difficulties to Łukasiewicz account of *futura contingencia*, though. Alas, they lie beyond the scope of this book.

thing does exist. To change the past—this is a mad idea. To give somebody the world of the past under his reign is to yield an enormous sphere of reality which he cannot reign. If impossibilities are prone to gradation, it is more impossible to revert yesterday's flight of a mosquito than to modify the moon's trajectory tomorrow. What has happened cannot be undone. But really, is it only true about the past? Is it only the past things and events which are such and such, so that they cannot be not such and such, or is it also the things that are to come that are already such and such and not different and they cannot come about as not such and such? Is it also the case that also in the future there is something that cannot be undone, because it has already happened? Many would firmly deny that. But after a consideration, having understood the issue, they would equally firmly assert it. And a scientifically educated man, with his eyes shut is eager to concede without a doubt that the whole future is such and such, and even though nothing in it has happened, it nevertheless cannot be undone. What is to come, allegedly differs from what has gone just like, for example, what happens now behind us in space differs from what is happening in front of us ... like a cloud above our heads from another cloud above the Pacific Ocean. [My translation of (Kotarbiński 1913: 74)].

Kotarbiński's reasoning resembles the discussion in Aristotle's *Peri Hermeneias*, IX. The main line of the argument is this. Suppose it is true that p is a sentence true at t' . Then it is now true that p is true at t' . But if that is the case, I cannot do anything to change it, because it has already been 'decided' that p at t' is to come. An analogous reasoning seems to apply to false sentences. Suppose that p is a sentence false at t' . Then, it is false that p is true at t' . But if it is already so, there is nothing we can do to change it.

Speaking more in terms of Kotarbiński's terminology, Kotarbiński identifies being an object of a true affirmative judgment with existence ('judgment' is taken from Kotarbiński's terminology). He argues that if a judgement is true at some time t , then it is true at any time later than t . It follows that whatever exists at some time t , exists at any time later than t (i.e. never ceases to exist), and whatever does not exist now, never comes to existence (for if what p states does not exist, then what *not*— p states does exist and continues to do so).

This conclusion seems to him quite problematic. We usually believe that we can create something: whether it is a result of our moral action, or a subject of our artistic or intellectual activity. Since this (following his definition of existence) cannot be the case (at least he so believes), if the propositions referring to those created objects have already been true before the act of creation, he concludes that some propositions referring to future freely created objects are neither true nor false.

This is just a guess about what the argument would have been like if Kotarbiński formulated it more explicitly. Here is how he originally phrased his view (again, I quote Kotarbiński at length since his work has not been translated):

Truly, an enormous majority of things to come, practically speaking, have more to do with the past than with future things. The flow of sea currents, earthquakes, volcano eruptions, the rotations of heavenly bodies cannot be changed. We cannot make it true that golf stream will flow through Poland, that the tomorrow's golf stream's flow is here. With this sort of things we are powerless. No matter whether we leave them behind or whether they are in the future. We have to reckon with those to come as well as with those that has passed. Those things are such and such and their having those properties in the future exists even though they are in the future ... It is already a true judgment which asserts that an object which lives will die in the future. My inference, pictorially speaking, of the property of being dead is

true already. But is my every position in the future equally existent? Is the fact that I will die equally true as the fact that I will die at this specific time, and that this and no other job I will have, that among two roads I will choose the one on the right and not the one on the left, that in that specific moment such and such thought will cross my mind, raised by my attention in that moment, that I will make a vow (or not), abide by it (or not)? Is this also already true today and was it true centuries ago, or at least since my birth? No, never! Those things are *undecided*, they are in our hands, under our reign, and the great practical difference which divides everything in two spheres is not the present moment: it only crosses the present moment at some places. Of course, on the other side of the river that flows on the border of our freedom, there remains the whole gigantic world of things that are ready to come, which already have the truth to accompany them. The freedom ends where the truth begins, not where the past comes into being. If I can do something, create it, it is not true that it already is. For how can one create what is, what happened or what already is created? One may, at most, create something similar, but not the very same thing. But neither what I can create is false. For how can one come to being, if the judgment stating its existence is false? If it came about (as created), we would have had a contradiction: a judgment about it would have been true and false. Apparently, maybe not, but in fact—indeed. For we are talking not about making something which is not present a future thing. We are not talking about a microbe infecting a presently healthy man. We are not talking about covering a canvas which is now white with paint. We do not need creativity (in our ontological sense) for that; and this is what one has in mind when he denies intuitively the impossibility of creating something when the corresponding judgment about it is false. Only when we truly create, we create the truth... For, for something to truly come into being it is required that before it does, the judgment stating it to be not true. This is the condition of creativity. On the other hand, there is no creativity, if before that moment where the judgment is to begin to be true, it is false. For what is false, cannot become true. If it is false that in the moment t an object has a given feature, one cannot make it that this object has this feature at t , even if t is a future moment. Otherwise—a contradiction. For if one can make this happen, then the assertion of this achievement cannot contradict any true judgment, whereas from the assertion of this achievement it follows that the assertion of what is achieved is true, that it is true that the object has this feature in that moment, but the assumption says that it is false. Contradiction. If anyone wanted to argue that the possibility of doing something does not presuppose the existence of the result, but rather only that the result will exist, and that he does not presuppose the truth of the corresponding judgment now, but rather that later, when we perform the action, it will be true, one can answer what follows. If it is false that a given object has a given feature right now, it will never be true, even when the action will have been performed; moreover, it will still be false. So a certain judgment will be true and will not be true (it will even be false), so—contradiction. For contradiction applies to the future, present and past existence equally. So, one cannot leave tomorrow, if we know today that who asserts this departure lies. [My translation of (Kotarbiński 1913: 79–80)]

The most striking feature of Kotarbiński's view is that he identifies truth with necessity and falsehood with impossibility:

Every truth is a necessity, every falsehood—an impossibility. For what is, has to be, because it cannot not be; if something is ready [i.e. already decided], but it is not, it cannot be, because already the judgment stating it is false, so it cannot become a truth. One can memorize it in a simpler way: a judgment is true if the thing is, and therefore when it is necessary, it is false—if the thing is impossible and it contradicts something that is.²⁸

²⁸ “Każda prawda jest koniecznością, każdy fałsz—niemożliwością. Gdy co jest bowiem, być musi, bo nie być nie może; gdy coś gotowe jest, a nie jest, to być nie może, bo już sąd o nim twierdzący jest fałszem, a więc nie może się stać prawdą. Można więc prościej sobie zapamiętać: sąd prawdziwy

In response to Kotarbiński, Leśniewski published a paper: “Is all truth only true eternally or is it also true without a beginning?” (1913a). Leśniewski begins with a few minor points.

Leśniewski on Kotarbiński’s Account of Existence

Kotarbiński’s at some point in his paper says: of existence:

(2.42) x exists if and only if x is an object such that an affirmative judgment referring to it is true.

Clearly, Kotarbiński’s approach differs from Leśniewski’s. Leśniewski defined truth in terms of the existence of an object named by the subject and the connotation of the predicate. Kotarbiński on the other hand explains what it is to exist in terms of truth.

(2.42) makes the notion of existence only as clear as our understanding of what a judgment refers to. Indeed, this is the notion that Leśniewski picks on. He adds a few premisses of his own:

(2.43) Every affirmative judgment asserts that an object possesses a property (that is, asserts a relation of inherence).²⁹

(2.44) Being an object to which a judgment refers is the same as being asserted by this judgment.

and concludes:

(2.45) Only relations of inherence can exist.

This, as he says, contradicts Kotarbiński, who explicitly stated his own existence (and obviously, Kotarbiński is not a relation of inherence).

This does not seem to be a very charitable reading of Kotarbiński, who probably would not accept all these additional premisses. True, Kotarbiński sometimes speaks as if judgments referred to facts (or relations of inherence) and sometimes he speaks as if judgments referred to common-sense objects. One option to read (2.42) charitably is to take it to say that (at least for atomic judgments) a subject of a judgment refers if its name is a subject in a true judgment and that the judgment is about this object. Another is to say that a judgment refers both to the inherence relation *and* to the object referred to by the subject. Either way, the objection is not compelling.

On What Has Gone by

Another Leśniewski’s argument relies on intuitions he has about what exists. Opposing Kotarbiński’s claim that what is gone by has not ceased to exist, Leśniewski (without giving any definition or argument) deploys the intuition that a relation of

(Footnote 28 continued)

jest, gdy rzecz jest, a więc gdy jest konieczna, fałszywy—gdy niemożliwa, sprzeczna z czymś, co jest.” (Kotarbiński 1913: 88–89)

²⁹ The word comes from Latin *in*-(English: *in*) and *-haerere* (English: *to hang, to stick*). The relation of inherence is the relation between a property and an object that has it.

inherence exists at t if and only if it actually takes place at t . He then insists that a relation which has gone by (i.e. ceased to take place) no longer exists.

This also is not a lethal objection. Kotarbiński himself mentions at least two different notions of existence:

Simply, the term in use is ambiguous. In one sense (which we will use) every object about which an affirmative judgment stating it is true, and vice versa: a judgment stating its object is true if the object exists ...in the other sense, the more colloquial one, only the present things exist, the past things existed and the future things will exist. (Kotarbiński 1913: 75)

and the objection stems from their conflation.

Objects with No Judgments

Leśniewski's another objection to (2.42) is that an object can exist without a judgment referring to it being true. This is supported by a nominalistic interpretation of Kotarbiński's notion of a judgment: it is possible that an object exists while no sentence-token referring to it exists. The impression one can get is that Kotarbiński and Leśniewski are talking past each other using different notions of a judgement.

Leśniewski's Notion of Eternal Truth

Leśniewski points out that is unlikely that there are eternally existing tokens: inscriptions, utterances etc. However, to be able to speak of eternal truths, he suggests a more charitable sense of 'being an eternal truth' on which 'being true' means 'being true if uttered'. In this sense, Leśniewski claims that all true sentences are true eternally.

One wonders why Leśniewski himself didn't employ this interpretation when criticizing Kotarbiński by saying that an object can exist without any true sentence token about it.

Another point is that (as we shall later see) Leśniewski was an extensionalist (among other things, he believed that the only connectives used in logic should be truth-functional). That being the case, it is hard to see how conditionalizing and saying 'true if uttered' helps, if the 'if' there is interpreted as material implication. For suppose no tokens of a certain type of sentence p and its negation are uttered. Then 'if p is uttered, it is true' and 'if $\neg p$ is uttered, it is true' both come out vacuously true, and so both p and $\neg p$ are eternally true.

Leśniewski: What is True Will Always be True

Let us move to Leśniewski's main argument:

(2.46) Suppose some judgement ' A is B ' which is now true, will be false.

Therefore:

(2.47) At some time t later than now, ' A is B ' is not true.

But:

(2.48) Since ' A is B ' is not true at t , ' A is not B ' is true at t .

This, Leśniewski claims, constitutes a contradiction:

(2.49) “This assumption leads then to the conclusion that the judgment ‘*A* is not *B*’, which contradicts the judgment ‘*A* is *B*’ true at the present time, becomes true at time *t*. An obstacle to the acceptance of the above conclusion is presented by the logical principle of contradiction which says that if one of two contradictory judgments is true, then the other must be false. Thus, if the judgment ‘*A* is *B*’ is true at the present time, we must conclude that the contradictory judgment ‘*A* is not *B*’ is always thus also at time *t*, false.” (1913a, 97–98)

A possible response (discussed by Leśniewski) is to say that if *t* is some later time, ‘*A* is *B*’ can be true now and false at *t*, because *A* can cease to be *B* some time between now and *t*.³⁰ To avoid this difficulty, Leśniewski insists that an atomic sentence with a predicate with no rigid time reference can express different claims at different times.

For instance, ‘Stanisław Leśniewski will die’ uttered in 1913 expresses the statement that at some time later than the time of utterance Leśniewski will cease to exist. The claim is true in 1913. If it is uttered after his death, it states the existence of a different relation of inherence. The former judgment is true, the latter is not (if Leśniewski does not exist, he can bear the relation of inherence to anything). So, Leśniewski focused on sentences whose subjects denote and predicates connote the same independently of the context (especially time) of utterance.

...if in any of the above judgments I substitute for the expressions whose meaning varies with time or circumstances such expressions whose semantic function is (for the given system of linguistic symbols) constant, I will immediately encounter truths which are eternally true. If, e.g., instead of judgments: ‘Stanisław Leśniewski will die’ or ‘Stanisław Leśniewski will cease to be alive’ I formulate the judgment: ‘Stanisław Leśniewski possesses the property of having ceased to be alive in the future of 2 p.m., March 2nd, 1913’, then this judgment will be always true.” (1913a, 98–99)

Indeed, we may safely assume that both Kotarbiński and Leśniewski did not discuss the eternity of truth of context- (especially tense-) sensitive sentences, and that the problem they focused on was rather whether those full-blown, precise sentences can change their truth values.

With this in mind, let us try to run Leśniewski’s argument without tense-sensitive predicates and with a particular example of a sentence. Suppose ‘Leśniewski is alive’ is uttered (and true) at time *t*₁ (say, in 1913). Uttered at *t*₁ it expresses the judgment: ‘Leśniewski is alive at *t*₁.’ Suppose further that this judgment is false at some later time *t*₂ (say in 1940). This means that at *t*₂ it is false that ‘Leśniewski is alive at *t*₁’. But then, at *t*₂ it is true that ‘Leśniewski is not alive at *t*₁’.

Now, why would this be a contradiction? Recall that Leśniewski explicitly says that he relies on “the logical principle of contradiction which says that if one of two

³⁰ “One might say that my proof would be quite valid but for the fault that it does not ‘accord with reality’. To support this objection one might cite a ‘random’, it seems, judgment which is originally true and then ceases to be true, e.g., the judgment ‘Stanisław Leśniewski will die’. This judgment is true for as long as I am alive; when I die it will become false because, when I shall not be here anymore, I shall not be able to die again. By becoming false at the time of my death, the judgment ‘Stanisław Leśniewski will die’ will give way to the true judgment ‘Stanisław Leśniewski died’ which in its turn is false until I shall die.” (1913a, 97–98)

contradictory judgments is true, then the other must be false. Thus, if the judgment 'A is B' is true at the present time, we must conclude that the contradictory judgment 'A is not B' is always [...] false." (1913a, 97–98) Applied to our case, this entails that if 'Leśniewski is alive at t_1 ' is true at t_1 , 'Leśniewski is not alive at t_1 ' is false at t_1 , and therefore always false, also at t_2 . But then 'Leśniewski is alive at t_1 ' is true at t_2 , which contradicts the assumption.

Leśniewski: What is True, Always was True

Leśniewski's argument for the claim that all truth is true without a beginning is very similar.

(2.50) Suppose some judgement 'A is B' which is now true, was false.

Hence:

(2.51) At some time t earlier than now, 'A is B' was not true.

But:

(2.52) Since 'A is B' is not true at t , 'A is not B' is true at t .

And again, Leśniewski says:

(2.53) ...on the basis of the law of contradiction—since the judgment 'A is B' is true at present, its contradiction 'A is not B' is always false, and so it was at time t '. (1913a, 103)

Assessment

Both Leśniewski's arguments rely on (at least) two assumptions. The principle of excluded middle (if a sentence is not true at t , then its negation is true at t), and an unusual version of the principle of contradiction which says that if 'A is B' is true at present, its contradiction 'A is not B' is **always** false.

One might object that the principle of excluded middle has been rejected by Leśniewski himself in his earlier paper. This is not a strong objection, because Leśniewski still claimed the principle is valid for sentences without empty or non-connoting names.

A more serious problem was that Leśniewski used a very unusual version of the principle of contradiction. Let us even put aside the fact that it differs from his own formulation from his paper on this principle. What is more worrying is that the eternal aspect of truth, which is not present in standard formulations of this principle, is built into it. What the principle of contradiction validates is the passage from:

'Leśniewski is alive at t_1 ' is true at t_1 .

to

(2.54) 'Leśniewski is not alive at t_1 ' is false at t_1 .

Alas, the claim that (2.54) entails that ‘Leśniewski is not alive at t_1 ’ is always false and therefore also at t_2 is neither normally built into the principle of contradiction, nor an assumption that Kotarbiński would endorse.

Leśniewski in his alleged application of the principle of contradiction actually performs two steps. The first one is the actual application of the original principle, and the second one assumes that iterated applications of temporally indexed truth attributions do not matter. That is, that once we have a sentence ‘ A is B at t_1 ’, adding or removing ‘is true at t_2 ’ to it does not change the truth-value of the sentence. But this is exactly what Kotarbiński contested.

2.8 Paradoxes

In the course of discussing the issues described above, Leśniewski approached a few paradoxes. Three of them (Nelson-Grelling’s, Meinong’s and Epimenides’) were discussed in passing in papers concerned mainly with something else, whereas Russell’s paradox was discussed specifically in 1914a and 1927.

2.8.1 The Nelson-Grelling Paradox

The paradox³¹ consists in asking ‘Does a man who kills all and only people who do not commit a suicide kill himself?’ and reasoning: If he kills himself, then he is not among the people who do not commit a suicide, so he does not kill himself. If he does not kill himself, then he is among the people who do not commit a suicide, and thus he kills himself.

Leśniewski’s answer in (1913b, 74–77) was that both: ‘He kills himself.’ and ‘He does not kill himself.’ are false, because there is no object which is a man who kills all and only people who do not commit a suicide. If there was such an object, this object would be contradictory. (Leśniewski’s considerations pertaining to the principle of excluded middle are relevant here. It is exactly because the subject is empty why both sentences can be false.)

2.8.2 Meinong’s Paradox

Meinong put forward the claim that whenever a judgement is being made, there is something about which this judgement is being made. Here is how he puts it:

That knowing is impossible without something being known, and more generally, that judgments and ideas or presentations are impossible without being judgments about and presentations of something, is revealed to be self-evident by a quite elementary examination of these experiences. (Meinong 1960, 76)

³¹ Grelling’s paradox is sometimes associated with quite a different reasoning pertaining to heterologicality. However, ‘Nelson-Grelling paradox’ is a term which Leśniewski originally used. Indeed, this is similar to a formulation to be found in Grelling and Nelson (1908).

This also pertains to negative existential statements, which claim that something does not exist:

...it is even more instructive to recall this trivial fact, which does not yet go beyond the realm of the *Seinsobjektiv*: Any particular thing that is not real must at least be capable of serving as the Object for those judgments which grasp its *Nichtsein*. It does not matter whether this *Nichtsein* is necessary or merely factual; nor does it matter in the first case whether the necessity stems from the essence of the Object or whether it stems from aspects which are external to the Object in question. In order to know that there is no round square, I must make a judgment about the round square...Those who like paradoxical modes of expression could very well say: "There are objects of which it is true that there are no such objects". (Meinong 1960, 82–83)

Specifically, Meinong seems to have been committed also to 'Some objects are contradictory'. Leśniewski gave what he thought to be a generalized version of Meinong's argument for this claim. Here it is.

Either it is true that there are no contradictory objects, or it is false that there are no contradictory objects. If the latter is the case, we easily get to the conclusion that some objects are contradictory. Suppose the former:

(2.55) There are no contradictory objects.

This seems to imply (at least on the Meinongian view):

(2.56) A contradictory object is not an object.

But 'a contradictory object is not an object' is true only if a certain object is contradictory. Thus we have:

(2.57) Some object is contradictory.

The point of this paradox is that to deny the existence of contradictory objects one has to truly predicate something about them. True predication requires the existence of the objects of which something is predicated, and thus to be able to say truly about contradictory objects that they do not exist one has to assume that there are contradictory objects.³²

Leśniewski argues that there is a simple response to the above reasoning. First, in the Leśniewskian framework, the proposition 'A contradictory object is not an object' is false, because its subject does not denote anything (recall that affirmative sentences with empty subjects were for Leśniewski false). Yet, it is true that there are no contradictory objects. Hence, (2.56) (which Leśniewski takes to be false) is not

³² "...if it were true that there are no 'contradictory objects', in other words, no objects are contradictory, then it would be true that 'a contradictory object is not an object'. It can be, however, true that 'a contradictory object' is not an object only in the case when a certain object is 'contradictory'. If no object were 'contradictory', then no proposition about the 'contradictory object' could be true, including the proposition 'a contradictory object is not an object'. Thus, if it were true: 'a contradictory object is not an object', then it must be also true that a certain object is contradictory. This being so, the assumption made at the beginning that no object is 'contradictory' entails the conclusion that a certain object is 'contradictory'." (1913b, 62–63)

just a reformulation of (2.55) (which he takes to be true) and does not follow from it (because no false sentence follows from a true one).

Following Leśniewski's remarks on existential propositions, the non-existence of contradictory objects should be rather parsed as:

(2.58) No object is contradictory.

which is true and does not imply the existence of any contradictory object, in contrast to (2.55) or (2.56).

2.8.3 *Epimenides' Paradox (Liar)*

The paradox, in Leśniewski's formulation, consists in the following reasoning. Suppose that Epimenides during the time between t_1 and t_2 utters exactly one sentence:

(2.59) The sentence asserted by Epimenides at time t_1-t_2 is false.

Is this sentence, as uttered by Epimenides, true or false? Suppose it is false. Then, what is stated in this sentence does not take place. Hence, it is not the case that the sentence uttered by Epimenides at time t_1-t_2 is false (for this is what the sentence states). But, if it is not false, it is true.

Suppose it is true. Then, what is stated in this sentence takes place. So it is the case that the sentence uttered by Epimenides at time t_1-t_2 is false.

Leśniewski's solution to this paradox makes use of (2.14), which is a somewhat artificial restriction on what names can refer to (namely, that they cannot refer to expressions whose parts they are), and the following claims:

(2.60) Sentences, understood as inscriptions or sounds, are the proper truth bearers.

(2.61) All affirmative categorical sentences with non-denoting subjects are false.

Consider the expression 'The sentence asserted by Epimenides at time t_1-t_2 ' as uttered by Epimenides at time t_1-t_2 (as it occurred in the sentence which he uttered). Does it denote at all? Following Leśniewski's convention regarding the denotation of connoting expressions, it denotes all and only those sentence tokens asserted by Epimenides at time t_1-t_2 , which have no common part with the expression 'the sentence asserted by Epimenides at time t_1-t_2 ' as uttered by Epimenides in t_1-t_2 . But there is no such a sentence. Therefore, this noun phrase does not denote anything.

Knowing that the subject of Epimenides' sentence does not have a denotation, Leśniewski could truly say in 1913:

(2.62) The sentence asserted by Epimenides at time t_1-t_2 is false.

It is an expression equiform to that uttered by Epimenides. Nevertheless, it was true, while the one uttered by Epimenides was false. Why?

Consider the subject of the sentence uttered by Leśniewski: 'The sentence asserted by Epimenides at time t_1-t_2 '. The sentence actually asserted by Epimenides has all

properties connoted by this subject, and does not have any expression (numerically) in common with this subject. Therefore the subject of the sentence uttered by Leśniewski denotes the sentence uttered by Epimenides. Moreover, since the sentence uttered by Epimenides does not have a denoting subject, it is true (when uttered by someone else than Epimenides, or by Epimenides but not at $t_1 - t_2$) that it is false.

Note also that from the fact that the sentence uttered by Epimenides is false it does not follow that it is true, because its subject does not refer to this sentence itself, and because the principle of excluded middle fails for sentences with non-denoting subjects.

There are some interesting aspects of this solution. First of all, it seems to be one of the very first (in modern logic) applications of some sort of a restriction excluding self-reference to the Liar paradox.

Second, it assumes that truth-value ascription is token-based. Two tokens of the same sentence (type) which do not contain any indexical expressions, uttered at two distinct occasions can have different truth-values.

Third, quite a few approaches to some paradoxes consist in claiming paradoxical sentences to be meaningless or devoid of truth-value. In contrast, Leśniewski's approach makes them false, without making their negations true (and that is where he employs his rejection of the principle of excluded middle).

Fourth, this solution does not save us from some versions of the liar paradox. (2.14) is too weak. Indeed, assume that no name names an expression of which it is a part. This does not undermine for example the following formulation:

(2.63) Sentence (2.64) is true.

(2.64) Sentence (2.63) is false.

No name in (2.63 and 2.64) names an expression of which it is a part. Still, a contradiction is derivable if we assume that every sentence is either true or false. Perhaps, a stronger assumption should have been taken to avoid the liar. Say, something like 'No circularity in naming should take place', that is, if we start with a given name, say m_0 , then there are no expressions m_1, \dots, m_k such that m_i names a part of m_{i+1} and $m_k = m_0$.

One worry about this sort of approach is that it is pretty strong and it seems to restrain us from considering some sentences which seem quite innocently true. This is a general problem with many solutions to the Liar paradox, and it is not clear whether any solution to the Liar can be given that does not violate some of our intuitions.^{33,34} Overall, Leśniewski's approach is of the same type as (and predates)

³³ See for instance Simmons (1993) for a critical survey.

³⁴ Another problem is that this does not provide a way out of the Yablo's paradox. Consider an infinite sequence of sentences s_0, s_1, s_2, \dots such that:

$$\begin{aligned} s_0 &= '\forall x (P_1(x) \rightarrow \neg Tr(x))', \\ s_1 &= '\forall x (P_2(x) \rightarrow \neg Tr(x))', \\ s_2 &= '\forall x (P_3(x) \rightarrow \neg Tr(x))', \dots \end{aligned} \tag{2.65}$$

Tarskian approach to natural language and paradoxes, and shares its virtues and vices.³⁵

2.8.4 Russell's Paradox

Leśniewski's approach to Russell's paradox is quite specific. As he addresses the problem in (1914a) he applies pretty much the same strategy which he applied in his earlier papers. He introduces his own understanding of certain notions and then argues that when they are taken in this sense the solution is such-and-such. When he discusses Russell's paradox, he does preserve its verbal formulation. But as he goes on explaining how his solution is supposed to work, it becomes more and more clear that what he means by 'class' is not what Frege or Russell had in mind.

While Frege's and Russell's notion of a class is closely related to the notion of set as it is employed in standard set theories (like Zermelo-Fraenkel set theory), Leśniewski's notion stems from intuitions about parthood relation. In Leśniewski's sense, a class of certain objects is just one bigger object whose those former objects are all parts of. So, he approaches Russell's paradox from the mereological (*meros* meaning *part* in Greek) perspective.³⁶ To see this clearly we need to follow Leśniewski's reasoning for a while.

As phrased by Leśniewski, the paradox assumes that one of the following sentences is true:

(2.66) The class of classes not subordinated to themselves is subordinated to itself.

(2.67) The class of classes not subordinated to themselves is not subordinated to itself.

where by 'subordinated to' Leśniewski means 'being an element of'. Next, standard paradoxical reasoning indicates that each of the above sentences implies the other, thus yielding a contradiction. If such a class is not subordinated to itself, it belongs to the class of of classes not subordinated to themselves, that is, to itself. If it is

(Footnote 34 continued)

Assume that the extension of every P_n , for $n = 1, 2, 3, \dots$, is $s_n, s_{n+1}, s_{n+2}, \dots$. So every s_i says that all s_j 's with $j > i$ are not true. Now ask yourself: is s_0 true? If yes, then for any $k > 0$ the sentence s_k is false. But this also means that for any $k > 1$ the sentence s_k is false. But this is exactly what s_1 says and hence s_1 is true, which falsifies s_0 . Suppose then that s_0 is false. This means that there is a $k > 0$ such that s_k is true. But we can repeat the reasoning we led about s_0 , this time about this s_k to show that s_k can't be true. Hence the paradox. However, no circularity in reference in Leśniewski's sense takes place: the subject of each sentence refers to all sentences below it. The question whether circularity is involved is sensitive to the notion of circularity involved. See for instance Leitgeb (2002) and Urbaniak (2009a).

³⁵ See Betti (2004a) for a historical discussion of the relation between Leśniewski's and Tarski's approach to the Liar. See for instance Soames (1999) for a more in-depth discussion of the Tarskian approach.

³⁶ This move will be discussed in detail in Chap. 5. Problems with Leśniewski's solution to Russell's paradox will be also discussed later on (Chap. 7). Here I just focus on presenting the solution from his early writings.

subordinated to itself, it does not possess the property which all its members are supposed to have, and therefore is not subordinated to itself.

Leśniewski, referring to his discussion of the principle of excluded middle, points out that if no object is the class of classes not subordinated to themselves, then both (2.66) and (2.67) are plainly false, without implying a contradiction.

Before we look at the main assumptions of Leśniewski's argument, let us see how he used variables. For the needs at hand it is enough to think about variables substitutionally. The substitution class contains all possible countable noun phrases. The difference between capital and lower case name variables is not essential. When Leśniewski wants to emphasize that the satisfaction of a formula requires that an individual name be substituted for a variable, he uses a capital letter. Since this was not a part of his official notation, I will use this convention in informal considerations, but dispose of it once I move to Leśniewski's formal systems.

So, for instance, 'an object P is subordinated to a class K iff for some $a \dots$ ' does not contain variables of three different sorts, but rather three different variables of one and the same type. Moreover, Leśniewski did not introduce a separate sort of variables for classes. He just used P and K to keep track of what variable stands for what (P is the first letter of 'przedmiot'—'object' in Polish, and K is the first letter of 'klasa'—'class').

If there is no empty set, it is enough to show that no object is the class of classes not subordinated to themselves in order to conclude that Russell's class does not exist. This is the strategy that Leśniewski employs.

The basic notion used in Leśniewski's early solution to Russell's paradox (1914a) is 'the class of object(s) n ' (we will use ' $Kl(n)$ ' in symbols), where n is a noun phrase. His assumptions governing this notion are as follows:

(2.68) There is no empty class.

Presumably, the intuition here is that a class is a mereological whole composed of those objects which are its parts (we also say, *their mereological fusion*). Since every object is its own part (in this sense),³⁷ there is no object devoid of parts. That is, there can be no mereological fusion if there is nothing to fuse.

(2.69) $Kl(Kl(n)) = Kl(n)$

Again, the underlying intuitions are mereological. If you fuse a bunch of objects, then the fusion of that fusion is just one and the same object. A pile of a pile of stones (if we admit piling single objects) is just the same pile of stones.

(2.70) Every atomic sentence with an empty subject is false.

This stems from convention (2.9). For an atomic sentence to be true, the object denoted by the subject has to have the properties connoted by the predicate. If the object does not denote any object, this condition is not satisfied and the sentence is false.

³⁷ This notion of parthood differs from the notion of *proper parthood* which requires the part to be "smaller" than the object of which it is a part.

(2.71) The universe of existing objects is the class of all objects which are not the universe.

This relies on the intuition that there is nothing more to the universe than all the objects that exist in it: fuse all objects and you have the universe.

Another notion Leśniewski uses is ‘subordination’ (nowadays, we would say ‘being an element’). He considers three ways of defining it and insists that these are the only three options:

(2.72) An object P is subordinated to a class K iff for some a (‘for some substitution of a possible countable noun phrase’) the following two conditions are fulfilled: (1) K is a class of objects a , (2) P is (an) a (or: P is one of the as).

(2.73) An object P is subordinated to a class K iff for every a the following two conditions are fulfilled: (1) K is a class of objects a ,³⁸ (b) P is a .

(2.74) An object P is subordinated to a class K iff for every a : K is a class of objects a iff P is a .

Leśniewski starts with rejecting options (2.73) and (2.74) from the above trilemma.

Rejecting (2.73)

Suppose that (2.73) works. Take a to stand for ‘a square circle’. For no P it is true that P is a square circle. Therefore, there is a name (‘a square circle’) which, substituted for a always falsifies both conditions formulated in (2.73).

The first condition is falsified because on Leśniewski’s view there is no empty class and the class of square circles would have to be empty (and simple sentences with empty subjects are false).

The second condition is false because nothing is a square circle. Thus, for any P and K it is not the case that for every name a : K is the class of objects a and P is a . Thus, on this definition, no object is subordinated to any class.

(Come to think of it, (2.73) is quite absurd to start with. For if K is to be a class of any objects, (2.73) requires it to be the class of a ’s for any a . Among other things, this would mean that K would have to be both the class of elephants and the class of things which are not elephants.)

Rejecting (2.74)

Suppose (2.74) is true and an object P is subordinated to a class K . Take:

(2.75) a means ‘ P or not P ’.

Clearly:

³⁸ I translate using the indefinite article: ‘a class of objects’, because the assumption is not taken to imply the uniqueness of a class of objects a .

(2.76) For any object Q , Q is P or not P .

Thus:

(2.77) P is a .

is obviously fulfilled.

Now, recall we use the definition on which:

K is a class of objects a iff P is a .

Since every object is a (on our fixed reading of a), K (the class of objects a) is the universal class:

(2.78) $K = Kl(a)$ is the universal class.

By (2.69) we get:

(2.79) $K = Kl(Kl(a))$

(2.74) also entails:

(2.80) K is a class of the universal class iff P is the universal class.

(just substitute 'the universal class' for a).

(2.79) tells us that K is a class of the universal class, so we get the right-hand side of (2.80):

(2.81) P is the universal class.

On the other hand, replace a from the formulation of (2.74) by 'an object which is not the universal class':

(2.82) K is a class of the objects which are not the universal class iff P is an object which is not the universal class.

Then (since, by (2.71), the universal class is the class of objects which are not the universe) again:

(2.83) $Kl(\text{the objects which are not the universal class})$ is the universal class

Since from (2.78) we already know that K is the universal class, we can conclude that the first condition from the formulation of (2.74) is satisfied. Hence, we also have the other one:

(2.84) P is an object which is not the universal class.

which contradicts (2.81).

Since the above argument (which follows Leśniewski closely) is somewhat cumbersome, let us take a look at another, less Leśniewskian formulation. (2.74) tells us that for any a :

K is a class of objects a ($K = Kl(a)$) iff P is a .

This allows us to take (2.85), (2.86) and (2.87) as assumptions. Let us proceed with the proof. (' b or non- b ' is a complex noun phrase naming all objects which are either b or not b (that is, all objects), ' V ' stands for 'the universal class', and 'non- V ' is a name which names all things which are not the universal class.)

$$(2.85) \quad K = Kl(b \text{ or non-}b) \text{ iff } P \text{ is } (b \text{ or non-}b) \quad (\text{assumption})$$

$$(2.86) \quad K = Kl(V) \text{ iff } P = V \quad (\text{assumption})$$

$$(2.87) \quad K = Kl(\text{non-}V) \text{ iff } P \neq V \quad (\text{assumption})$$

$$(2.88) \quad P \text{ is } (b \text{ or non-}b) \quad (\text{logic})$$

$$(2.89) \quad Kl(b \text{ or non-}b) = V \quad (\text{logic})$$

$$(2.90) \quad K = Kl(b \text{ or non-}b) \quad (2.85), (2.88)$$

$$(2.91) \quad K = V \quad (2.89), (2.90)$$

$$(2.92) \quad Kl(Kl(b \text{ or non-}b)) = Kl(b \text{ or non-}b) \quad (2.69)$$

$$(2.93) \quad Kl(Kl(b \text{ or non-}b)) = K \quad (2.90), (2.92)$$

$$(2.94) \quad Kl(Kl(b \text{ or non-}b)) = Kl(V) \quad (2.89)$$

$$(2.95) \quad K = Kl(V) \quad (2.93), (2.94)$$

$$(2.96) \quad P = V \quad (2.86), (2.95)$$

$$(2.97) \quad V = Kl(\text{non-}V) \quad (2.71)$$

$$(2.98) \quad K = Kl(\text{non-}V) \quad (2.91), (2.97)$$

$$(2.99) \quad P \neq V \quad (2.87), (2.98)$$

Contradiction: (2.96), (2.99).

Dealing with (2.72)

Given Leśniewski's assumptions, the only remaining possibility is (2.72). This formulation has two interesting consequences:

$$(2.100) \quad \text{Every object } n \text{ is subordinated to } Kl(n).$$

$$(2.101) \quad \text{Not every object subordinated to } Kl(n) \text{ is an } n.$$

The first claim is quite simple. For an object n to belong to $Kl(n)$ it is enough that for some a , n is a and $Kl(n)$ is $Kl(a)$. This, however, is witnessed by n itself, for n is n and $Kl(n)$ is $Kl(n)$. (The latter claim is not logically trivial, for on Leśniewski's view, for $Kl(n)$ to exist, n has to exist.)

The second claim, which at first seems unusual, can serve as an example of how 'being subordinated to' is (tacitly, at this point) connected with 'being a part'.

Consider a sphere Q . As Leśniewski says, the class of (all) halves of the sphere Q is the sphere Q itself. The sphere Q is also the class of (all) quadrants of Q . Thus,

we have the conclusion that any half of Q is subordinated to the class of quadrants of Q . It is a general point to which we will get back when discussing Leśniewski's understanding of class (Sect. 5.1). Given two names such that the whole constituted by all objects denoted by the first is also the whole constituted by all objects denoted by the second, any object denoted by the first name is subordinated to the class of objects denoted by the second name, even if no object denoted by the first name is denoted by the second name.

Now we are ready to give the argument for the main thesis, saying that every class is subordinated to itself. Define ' \cup ' as a name-forming operator defined by: P is $(Q \cup R)$ iff $(P \text{ is } Q) \vee (P \text{ is } R)$. We will show that if K is $Kl(n)$ for some n , then K is subordinated to itself.³⁹

$$(2.102) \quad K = Kl(n) \text{ (for some } n) \quad \text{(assumption)}$$

$$(2.103) \quad Kl(n) = Kl(n) \cup Kl(n) \quad \text{(logic)}$$

$$(2.104) \quad Kl(n) = Kl(Kl(n)) \cup Kl(n) \quad (2.69), (2.103)$$

$$(2.105) \quad Kl(a) \cup Kl(b) = Kl(a \cup b) \text{ (for any } a, b) \quad \text{(logic)}$$

$$(2.106) \quad Kl(Kl(n)) \cup Kl(n) = Kl(Kl(n) \cup n) \quad (2.105)$$

$$(2.107) \quad K = Kl(Kl(n) \cup n) \quad (2.102), (2.104), (2.106)$$

$$(2.108) \quad K \text{ is } Kl(n) \cup n \quad (2.102), \text{ logic}$$

$$(2.109) \quad K \text{ is subordinated to } K \text{ iff for some } a, K = Kl(a) \text{ and } K \text{ is } a \quad (2.72)$$

$$(2.110) \quad K = Kl(Kl(n) \cup n) \text{ and } K \text{ is } (Kl(n) \cup n) \quad (2.107), (2.108)$$

$$(2.111) \quad \text{For some } a, K = Kl(a) \text{ and } K \text{ is } a \quad (2.110)$$

$$(2.112) \quad K \text{ is subordinated to itself} \quad (2.109), (2.111)$$

This completes Leśniewski's early solution to Russell's paradox. If every class is subordinated to itself, then no class is not subordinated to itself. So the class of classes not subordinated to itself would be empty. But (Leśniewski insists) there is no empty class. Therefore, the class of classes not subordinated to itself does not exist. That being the case, both 'the class of classes not subordinated to itself is subordinated to itself' and 'the class of classes not subordinated to itself is not subordinated to itself' are false. (Since the subject is empty, the principle of excluded middle fails.)

One objection which Leśniewski put forward against the standard formulation of Russell's paradox was that the inference from:

K is subordinated to the class of classes which are not subordinated to themselves.

to:

K is not subordinated to itself.

³⁹ This is a streamlined version of Leśniewski's argument, the original is less accessible.

is invalid. In fact, if we assume the mereological account of classes, we think of the class of objects P as a whole consisting of all of P 's parts. Moreover, as we will later explain in more detail (in Chap. 5), being an element of (or being subordinated to) this class does not force an object to be a P itself. It may as well be a part of a P or a whole consisting of a few of P 's or a whole consisting of some parts of some P 's.

For example, consider a herd of ten cows: $a_1, a_2, a_3, \dots, a_{10}$. Let us use the name 'cow α ' as a name which can be truly predicated only of our cows. Now, ' $Kl(cow(\alpha))$ ' is a name of the mereological fusion of our cows. Being an element of a herd is, following Leśniewski, the same as being a part of it. But in this sense, not only our cows are subordinated to this class. Among parts of the fusion are also cow halves, legs, heads, pairs of cows etc. Clearly, being subordinated to the class $Kl(cow(\alpha))$ does not imply being a cow.

Note that assumption (2.71), used in Leśniewski's rejection of (2.74), also shows some predilections towards the mereological understanding of the class. For take the name 'all objects that are not the universal class'. The class of all objects that are not the universal class on the distributive (non-mereological) reading is not the universal class. For there is some object which (by (2.74), which seems to mirror distributive intuitions adequately) is not its element (namely, the universal class).

On the other hand, on the mereological reading the class of a is the mereological fusion of all objects a . This being the case, in some sense, the universal class is nothing over and above the fusion of all other objects in the world. The universal class is a part of the fusion of all objects that are not the universal class.

Leśniewski returned to this paradox after developing his logical systems. A classic discussion of this formal treatment is to be found in Sobociński (1949b). Problems with this approach are discussed in Urbaniak (2008a). I will also discuss this approach later, in Chap. 7.

2.9 On Universals

Leśniewski devoted some space to the rejection of the existence of abstract objects (1913b, 50–53). This reasoning starts with a tentative definition of a general object:

(2.113) A is general with respect to a group of objects iff it possesses only those properties which are common to all those objects.

For instance, the universal 'man' cannot have any properties common only to a few men, but rather it has to have only those properties that all of them have. The argument now proceeds as follows.

Suppose there is an object P_k which is general with respect to individuals P'_1, P'_2, \dots, P'_n . For every individual object P'_i one can always find certain property c_i which is not common to all individual objects P'_1, P'_2, \dots, P'_n . For instance, the property of being identical with P'_i . So, P_k does not possess the property c_i .

Moreover, the individual object P'_i does not possess the property of not possessing the property c_i . Hence, the general object P_k does not possess the property of not possessing the property c_i (because, on the currently entertained definition, a general object cannot possess any property which an object that falls under it does not have). But then, P_k possesses the property c_i . Thus, any general (universal) object is contradictory.

The argument is not extremely convincing. The anti-nominalist can simply rely on a different account of universals. For instance, one may make a distinction between the properties of the universal itself (like: being universal, being immaterial, being abstract etc.) and the content of the universal. The universal 'man' can be said to be abstract whereas no individual man is an abstract object. Introducing the notion of content to the account of universals seems to refute Leśniewski's objection. Sure, if an object does not have the property of not possessing the property c_i , then it possesses the property c_i itself. But it is doubtful that if the property of not possessing the property c_i is not in the content of a universal, then the property of c_i is in its content. With respect to a given content properties are not divided in two groups: those, which belong to the content, and those, whose negated properties belong to the content. Rather, they divide in three groups: those which belong to the content, those the negated properties of which belong to the content, and those which are not 'decided' by the content (that is properties such that neither themselves nor their negated properties belong to the content).

Gryganiec (2000) suggests another reason to treat the definition used by Leśniewski as inadequate. Here is how he formulates his argument:

The incorrectness of the definition of the object Op can be also shown in a different way. Suppose there are two individual objects P_1 and P_2 . Assume moreover that the first one, that is P_1 , possesses n properties, whereas the second one— P_2 — $n + m$ properties. We do not decide here whether symbols n and m denote finite or infinite sets of properties; we only know that those sets exhaust the ontic furnishing of those objects. The universal $Op^{(P_1, P_2)}$ with respect to objects P_1 and P_2 —according to Leśniewski's definition—will only have the properties common to objects P_1 and P_2 . Therefore, the object $Op^{(P_1, P_2)}$ will have n properties. This being the case, $Op^{(P_1, P_2)}$ —thanks to the principle of extensionality—will be identical with the object P_1 , which also possesses n properties, that is, it will be an individual. [my translation]

Let's grant that by n and m Gryganiec understands sets of properties and not the cardinalities of those sets (he is somewhat ambiguous about it, but if we do not grant it, the argument obviously will not work).

Still, the argument is not very compelling. First, Gryganiec assumes that for P_1 and P_2 their universal exists. But neither Leśniewski's argument nor the Platonist position requires that for any two objects there be an objects which is their universal. But this is a minor scratch. More importantly, Gryganiec asks us to assume that there exist two distinct individual objects one of which has all the properties that the other has (and some more). But such a possibility is hard to imagine.

If one admits that being identical with an object is a property, and that not having a property is also a property, then take the property of being identical with P_2 (call it f). P_1 clearly does not have property f . Then P_1 has the property of not having the

property f . But since P_2 has all the properties of P_1 , P_2 also has the property of not having the property f . That is, P_2 has the property of not having the property that it obviously has, which does not seem possible. If, on the other hand, not having a property is not treated as a property, Leśniewski's argument does not work anyway and there is no point in putting forward a counterexample.

We can try to salvage Gryganiec's argument by denying that being identical with an object is a property. If so, we need a stronger and yet reasonable notion of property. Now, the problem is that spatio-temporal location seems to be a good candidate for a property of an individual even in this stronger sense. But then, P_2 could not have all the properties that P_1 has unless they completely overlapped. But if overlapping non-identicals is the metaphysical construct that has to be conjured to make the argument work, the argument is at least controversial.

Leśniewski later formulated a formalized version of his argument. The new version did not employ the notion of a property and was expressed in the language of Ontology. I will get back to this argument in Sect. 4.5 after introducing the required formal apparatus.

2.10 Further Readings

As for Leśniewski's philosophical views, the standard place to start is Luschei (1962). For a reader who wishes to see the character in a wider perspective, (Woleński 1985) (in Polish) is the classic—a good English translation of it is Woleński (1989). He has a chapter on Leśniewski, which as far as technical aspects of the logical systems are concerned is much more detailed than Luschei's book, but is not meant to be comprehensive. Other background-covering works are Woleński (1986a and 1999). The Polish school of logic is presented in a more general survey on the development of logic between the two world wars in Grattan-Guinness (1981). Jadcak (1993a,b) discusses Leśniewski's role in the Lvov-Warsaw school. Leśniewski's letters to Kazimierz Twardowski have been recently published as Leśniewski (1999). The question whether Leśniewski was a philosopher at all is asked (and answered positively) by Woleński (2000). Simons (2008a) provides a very readable survey in his Stanford Encyclopedia entry on Leśniewski.

Sanders (1996) discusses informally Leśniewski's motivations for his systems. He does not go beyond the content of Luschei (1962) and Poli and Libardi (1999). A good but quite informal survey of Leśniewski's achievements is Kearns (1967), which also contains an interesting evaluation of Leśniewski's work. Kearns argues that Leśniewski's view of the world is "defective in that it does not recognize structure" (p. 88), which, he suggests, deprives "Mereology of significance". Leśniewski's early philosophical views are discussed in French by Peeters (2005).

Rickey (1976, reprinted as Szrednicki and Stachniak 1998) provides a more technical overview of some results about Leśniewski's systems obtained before 1972. An interesting survey of technical aspects of Leśniewski's work, especially of the relation between Ontology and set theory has been published by Surma (1977).

Leśniewski's view on truth-bearers in the context of the Lvov-Warsaw school is presented in Woleński and Rojszczak (2005).

Sinisi (1966) discusses Leśniewski's criticism of Whitehead's theory of events.

Betti (2004a) presents Leśniewski's solution to the liar paradox and argues that it was Leśniewski and not Tarski who suggested regimentation of natural language as a device which is necessary to avoid paradoxes.

Regarding paradoxes, an interesting account which employs some of Leśniewski's ideas is Hiż (1984). The relation between the early and informal solution to Russell's paradox from 1914 and the later development of Leśniewski's formal systems are explored by Sinisi (1976).

Leśniewski's nominalism is nicely discussed by Hintze (1995), and the connection between it and Goodman's approach is explored by Praker (1983). Simons provides a good introduction to Leśniewski's nominalistic inscriptional approach to metalogic (2002) and provides a good background on nominalism in the Lvov-Warsaw school (1993, reprinted in Szrednicki and Stachniak 1998).

Tadeusz Kotarbiński, Leśniewski's good friend, used Leśniewski's systems as a tool while putting forward his own reism (Kotarbiński 1929). As Woleński (1986b) convincingly explains, Ontology itself is neutral with respect to the problem and it is rather the form of the logical system which makes it easier to speak of reducing various non-concrete terms to other terms. In other words, Leśniewski's systems do not contain terms intended to represent abstract entities, but if there were such entities, it would be possible to express facts about them in Leśniewski's languages.

There is also an interesting connection between Brentano's analysis of categorical propositions and Ontology, explored in Simons (1984).

An important discussion of the impact of Leśniewski's thought can be found in Betti (2008b). While Tarski shared nominalistic intuitions with Leśniewski and Tarskian impossibility of giving a satisfactory theory of truth for ordinary language and the analysis of quotation marks can be already found in Leśniewski, there are deep discrepancies between the interests of Tarski and Leśniewski. While the latter was not interested in model theory, the former was partially responsible for its origination. While the former enjoyed working on set theory and metalogic, the latter focused on purely axiomatic work on logical systems, without doing much metatheory and definitely not liking set theory. Yet, Betti convincingly argues that the story about a great breakup between the two logicians is a myth: Tarski's interest were quite different to start with and it seems to her "that the whole story was more, from Tarski's point of view, a fight for freedom from a 100 percent genius master, one whose commitment to a radical philosophical position was, for an extraordinarily gifted and ambitious mathematician, very much in the way." (Betti 2008a, 56)

A somewhat surprising similarity between Leśniewski and Mally has been discovered and described by Gombocz (1979).

Leśniewski's systems are also known for their application to history of philosophy. Thom (1986) interestingly attempts to cast new light on Parmenides, Gorgias, Leucippus and Democritus using a modified version of Ontology. Henry (1972, 1969) attempted to apply Leśniewski's logics to analysis of some medieval concepts.

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Leśniewski's Systems of Logic and Foundations of
Mathematics

Urbaniak, R.

2014, XIII, 229 p. 3 illus., Hardcover

ISBN: 978-3-319-00481-5