

Theory and History of Ontology (www.ontology.co) by Raul Corazzon | e-mail: rc@ontology.co

Bibliography on the Logical Work of Stanislaw Leśniewski

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Works of Leśniewski in English translation

1. Leśniewski, Stanislaw. 1967. "Introductory Remarks to the Continuation of My Article *Grundzüge Eines Neuen Systems Der Grundlagen Der Mathematik*." In *Polish Logic 1920-1939*, edited by Mccall, Storrs, 116-169. Oxford: Clarendon Press.
2. ———. 1967. "On Definitions in the So-Called Theory of Deduction." In *Polish Logic 1920-1939*, edited by Mccall, Storrs, 170-187. Oxford: Clarendon Press.
3. ———. 1983. "On the Foundations of Mathematics." *Topoi. An International Review of Philosophy* no. 2:7-52.

4. ———. 1988. *S. Leśniewski's Lecture Notes in Logic*. Dordrecht: Kluwer.

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2. Ajdukiewicz, Kazimierz. 1967. "Syntactic Connection." In *Polish Logic 1920-1939*, edited by McCall, Storrs, 207-231. Oxford: Clarendon Press.

Originally published in German as: *Die syntaktische Konnexität*, *Studia Philosophica*, 1, 1935, pp. 1-27.

3. Betti, Arianna. 1995. *Logica Ed Esistenza in Stanislaw Leniewski*, Università degli Studi di Firenze.

Tesi di laurea inedita (Relatore: Ettore Casari).

4. ———. 1998. "De Veritate: Another Chapter the Bolzano-Leśniewski Connection." In *The Lvov-Warsaw School and Contemporary Philosophy*, edited by Kijania-Placek, Katarzyna and Wolenski, Jan, 115-137. Dordrecht: Kluwer.
5. ———. 1998. "Il Rasoio Di Leśniewski." *Rivista di Filosofia*:87-112.
6. ———. 2004. "Leśniewski's Early Liar, Tarski and Natural Language." *Annals of Pure and Applied Logic* no. 127:267-287.

"This paper is a contribution to the reconstruction of Tarski's semantic background in the light of the ideas of his master, Stanislaw Leśniewski. Although in his 1933 monograph Tarski credits Leśniewski with crucial negative results on the semantics of natural language, the conceptual relationship between the two logicians has never been investigated in a thorough manner. This paper shows that it was not Tarski, but Leśniewski who first avowed the impossibility of giving a satisfactory theory of truth for ordinary language, and the necessity of sanitation of the latter for scientific purposes. In an early article (1913) Leśniewski gave an interesting solution to the Liar Paradox, which, although different from Tarski's in detail, is nevertheless important to Tarski's semantic background. To illustrate this I give an analysis of Leśniewski's solution and of some related aspects of Leśniewski's later thought."

7. ———. 2006. "Sempiternal Truth. The Bolzano-Twardowski-Leśniewski Axis." In *The Lvov-Warsaw School. The New Generation*, edited by Jadacki, Jacek Jusliuz and Pasniczek, Jacek, 371-399. Amsterdam: Rodopi.
 8. ———. 2009. "Leśniewski's Systems and the Aristotelian Model of Science." In *The Golden Age of Polish Philosophy. Kazimierz Twardowski's Philosophical Legacy*, 93-111. Dordrecht: Springer.
 9. Canty, John Thomas. 1969. "Leśniewski's Terminological Explanations as Recursive Concepts." *Notre Dame Journal of Formal Logic* no. 10:337-369.
- "The terminological concepts for the system of Ontology extended by the axiom of infinity are shown to be definable within that system. in 1929 Leśniewski first published terminological explanations for his system of logic, where he used certain concepts from his system of Mereology along with others such as equiformity. In this paper the terminological concepts are given entirely within the system of Ontology extended by the axiom of infinity. Since the definitions given are recursive, the incompleteness of this extension of Ontology is readily established."
10. Chrudzimski, Arkadiusz. 2006. "The Young Leśniewski on Existentials Propositions." In *Actions, Products, and Things. Brentano and Polish Philosophy*, edited by Chrudzimski, Arkadiusz and Łukasiewicz, Dariusz, 107-120. Frankfurt: Ontos Verlag.
 11. Clay, Robert F. 1968. "The Consistency of Leśniewski's Mereology Relative to the Real Number System." *Journal of Symbolic Logic* no. 33:251-257.
 12. ———. 1980. "Introduction to Leśniewski's Logical Systems." *Annali dell'Istituto di Discipline Filosofiche dell'Università di Bologna*:5-31.
 13. Cocchiarella, Nino. 2001. "A Conceptualist Interpretation of Leśniewski's Ontology." *History and Philosophy of Logic* no. 22:29-43.

"A first-order formulation of Leśniewski's Ontology is formulated and shown to be interpretable within a free first-order logic of identity extended to include nominal quantification over proper and common-name concepts. The latter theory is then shown to be interpretable in monadic second-order predicate logic, which shows that the first-order part of Leśniewski's Ontology is decidable."

14. Davis, Charles C. 1976. "A Note on the Axiom of Choice in Leśniewski's Ontology." *Notre Dame Journal of Formal Logic* no. 17:35-43.
15. Gessler, Nadine. 2005. "Introduction À L'œuvre De S. Leśniewski. Fascicule Iii - La Méréologie." *Travaux de Logique (Neuchâtel)*.
16. ———. 2007. "Introduction À L'œuvre De S. Leśniewski. Fascicule V - Leśniewski, Lecteur De Frege." *Travaux de Logique (Neuchâtel)*.
17. Gobber, Giovanni. 1985. "Alle Origini Della Grammatica Categoriale: Husserl, Leśniewski, Ajdukiewicz." *Rivista di Filosofia Neo-Scolastica* no. 76:258-295.
18. Gombocz, Wolfgang. 1979. "Leśniewski Und Mally." *Notre Dame Journal of Formal Logic* no. 20:934-946.
19. Grzegorzczuk, Andrzej. 1955. "The Systems of Leśniewski in Relation to Contemporary Logical Research." *Studia Logica* no. 3:77-95.
20. Henry, Desmond Paul. 1969. "Leśniewski's Ontology and Some Medieval Logicians." *Notre Dame Journal of Formal Logic* no. 10:324-326.

"In the issue of this journal dated October 1966 (Vol. VII, No. 4, pp. 361-364) Professor John Trentman suggested limitations on my claim that Leśniewski's Ontology is of use in furnishing formal analyses of medieval logical theories, his grounds being that certain medieval theories deny what is called the "two-name theory of predication" allegedly common to Ockham and Ontology. Hence while the work of Ockhamists would be analysable with reference to Ontology, that of those "Thomists" who deny the two-name theory would not. Professor Trentman then goes on to suggest that for such "Thomist" analyses to take place, "something like Frege's functional analysis of predication", is needed to show the "disparity of semantic category that holds between the subject and the predicate", thereby implying that no such form is available in Ontology, and that the allegations about the inadequacy of the two-name theory could have escaped my notice. Neither of these implications is tenable. Ignoring the second of them, I can deal with the first by exemplifying the manner in which the Ontology in question deals with the relations between names and verbs (i.e. functors which when completed with nominal arguments form propositions)."

21. ———. 1972. *Medieval Logic and Metaphysics*. London: Hutchinson.
22. Hiz, Henry. 1984. "Frege, Leśniewski and Information Semantics on the Resolution of Antinomies." In *Foundations: Logic, Language, and Mathematics*, edited by Leblanc, Hugues, Mendelson, Elliott and Orenstein, Alex, 51-72. Dordrecht: Kluwer.
23. Ishimoto, Arata. 1997. "Logicism Revisited in the Propositional Fragment of Leśniewski's Ontology." In *Philosophy of Mathematics Today*, edited by Evandro, Agazzi and Darvas, György, 219-232. Dordrecht: Kluwer Academic Publishers.

24. Iwanus, Bogusław. 1969. "An Extension of the Traditional Logic Containing the Elementary Ontology and the Algebra of Classes." *Studia Logica* no. 25:97-135.

"The paper deals with the axiomatic Calculus of Names (S sub 2) which is an extension of the system S sub 1 presented in my paper "Remarks about syllogistic with negative terms" (*Studia logica*, vol. XXIV). The primitive terms of S sub 2 are the function of a categorical universal-affirmative proposition, the complement of a set, and the empty set. In S sub 2 one is given the definitions of addition and multiplication of sets, the universal set and the relation epsilon (... is ...) which corresponds semantically to the primitive term of Leśniewski's Ontology. It is proved that the elementary ontology and the elementary algebra of classes are fragments of s sub 2."

25. ———. 1969. "Remarks About Syllogistic with Negative Terms." *Studia Logica* no. 24:131-137.

"The article presents a system S of syllogistic based on three axioms. The functor "a" / every...is.../ and the sign of nominal negation are primitive terms of system S. The known axiomatic systems of syllogistic with negative terms constructed by I. Thomas, A. Wedberg and C. A. Meredith are fragments of system S. It seems that the axioms of system S better characterize the categorical propositions containing negative terms since this characterization excludes some non-intuitive interpretations of such propositions, admissible in the above mentioned systems. It is also mentioned that there exists an extension of system S containing the elementary algebra of classes and the elementary Ontology of Leśniewski."

26. Jacquette, Dale. 2006. "Bochenski on Property Identity and the Refutation of Universals." *History and Philosophy of Logic* no. 35:293-316.

"An argument against multiply instantiable universals is considered in neglected Essays by Stanislaw Leśniewski and I.M. Bochenski. Bochenski further applies Leśniewski's refutation of universals by maintaining that identity principles for individuals must be different than property identity principles. Leśniewski's argument is formalized for purposes of exact criticism, and shown to involve both a hidden vicious circularity in the form of impredicative definitions and explicit self-defeating consequences. Syntactical restrictions on Leibnizian indiscernibility of identicals are recommended to forestall Leśniewski's paradox."

27. Kearns, John. 1967. "The Contribution of Leśniewski." *Notre Dame Journal of Formal Logic* no. 8:61-93.

28. ———. 1969. "Two Views of Variables." *Notre Dame Journal of Formal Logic* no. 10:163-180.

"This paper argues that there are two fundamental ways to regard variables in formalized languages. One way, associated with Russell and Quine, regards variables as autonomous referential expressions. On this view, quantification is the fundamental device for indicating ontological commitments. The second way to regard variables is linked to Frege and Leśniewski; variables are regarded as replacements for constant expressions. Such a view leads to an understanding of quantifiers in terms of substitution instances of the quantified expressions. It is argued that the second way of regarding variables is preferable to the first way, and that no logical results need be given up if this way is adopted."

29. Kotarbinski, Tadeusz. 1966. *Gnosiology. The Scientific Approach to the Theory of Knowledge*. Oxford: Pergamon Press.

Original Polish edition 1929; second revised edition 1961.

Translated from the Polish by Olgierd Wojtasiewicz; translation edited by G. Bidwell and C. Pinder

30. Küng, Guido. 1977. "The Meaning of Quantifiers in the Logic of Leśniewski." *Studia Logica* no. 26:309-322.

31. ———. 1985. "La Logique Est-Elle Une Discipline Des Mathématiques out Fait-Elle Partie De L'ontologie?" *Dialectica* no. 39:243-258.

"Heinrich Scholz and J. M. Bochenski have claimed that the laws of formal logic are the most general laws about things, properties, relations, states-of-affairs, etc. Others have mixed up logic and set theory. But Leśniewski's interpretation of the quantifiers shows that properly speaking logic belongs neither to ontology nor to mathematics."

32. Lejewski, Czeslaw. 1954. "Logic and Existence." *British Journal for the Philosophy of Science* no. 5:104-119.

"I wish to conclude with a brief summary of the results. The aim of the paper was to analyse rather than criticize. I started by examining two inferences which appeared to disprove the validity of the rules of universal instantiation and existential generalization in application to reasoning with empty noun-expressions. Then I distinguished two different interpretations of the quantifiers and argued that under what I called the unrestricted interpretation the two inferences were correct. Further arguments in favour of the unrestricted interpretation of the quantifiers were brought in, and in particular it was found that by adopting the unrestricted interpretation it was possible to separate the notion of existence from the idea of quantification. With the aid of the functor of inclusion two functors were defined of which one expressed the notion of existence as underlying the theory of restricted quantification while the other approximated the term exist(s) as used in ordinary language.

It may be useful to supplement this summary by indicating some aspects of the problem of existence which have not been included in the discussion. I analyzed the theory of quantification so far as it was applied in connection with variables for which noun-expressions could be substituted and my enquiry into the meaning of exist (s) ' was limited to cases where this functor was used with noun-expressions designating concrete objects or with noun-expressions that were empty. It remains to explore, among other things, in what sense the quantifiers can be used to bind predicate variables and what we mean when we say that colours exist or that numbers exist. These are far more difficult problems, which may call for a separate paper or rather for a number of separate papers." (p. 119)

33. ———. 1958. "On Implicational Definitions." *Studia Logica* no. 8:189-206.

34. ———. 1958. "On Leśniewski's Ontology." *Ratio* no. 1:150-176.

35. ———. 1960. "A Re-Examination of the Russellian Theory of Descriptions." *Philosophy* no. 35:14-29.

36. ———. 1967. "A Single Axiom for the Mereological Notion of Proper Part." *Notre Dame Journal of Formal Logic* no. 4:279-285.

37. ———. 1969. "Consistency of Leśniewski's Mereology." *Journal of Symbolic Logic* no. 34:321-328.

"Leśniewski's Mereology presupposes his Ontology, which in turn presupposes his Protothetic. A proof is outlined to show that if we interpret name-variables as proposition-variables and if at the same time we interpret the ontological 'epsilon' as the functor of conjunction and the mereological 'el' as the functor of assertion then the axioms and directives of Ontology and Mereology become respectively theses and directives of Protothetic."

38. ———. 1974. "A System of Logic for Bicategorical Ontology." *Journal of Philosophical Logic* no. 3:265-283.

39. ———. 1976. "Outline of Ontology." *Bulletin of the John Rylands University Library of Manchester* no. 59:127-147.

40. ———. 1979. "On the Dramatic Stage in the Development of Kotarbisnki's Pansomatism." In *Ontologie Und Logik. Ontology and Logic.*, 197-214. Berlin: Duncker & Humblot.

Proceedings of an International Colloquium (Salzburg, 21-24 September 1976)
Discussion pp. 215-218

41. ———. 1981. "Logic and Ontology." In *Modern Logic. A Survey*, edited by Evandro, Agazzi, 379-398. Dordrecht: Reidel.

42. ———. 1983. "A Note on Leśniewski's Axiom System for the Mereological Notion of Ingredient or Element." *Topoi* no. 3:63-72.

43. ———. 1985. "Accommodating the Informal Notion of Class within the Framework of Leśniewski's Ontology." *Dialectica* no. 39:217-241.

"Interpreted distributively the sentence 'Indiana is a member of the class of American federal states' means the same as 'Indiana is an American federal state'. In accordance with the *collective* sense of class expressions the sentence can be understood as implying that Indiana is a part of the country whose capital city is Washington. Neither interpretation appears to accommodate all the intuitions connected with the informal notion of class. A closer accommodation can be achieved, it seems, if class expressions are interpreted as verb-like expressions of a certain kind as available within the framework of Leśniewski's Ontology."

44. ———. 1986. "Logic and Non-Existence." *Grazer Philosophische Studien* no. 25/26:209-234.

"An attempt is made in the present essay to accommodate various senses of the notion of existence and of that of non-existence within the framework of logic. With this aim in view a system of Leśniewski's Ontology, referred to as System S, is outlined. Equipped with appropriate definitions and illustrated with a selection of

theses it offers a logical theory of existence and non-existence. The usefulness of the theory is then tested by interpreting in its terms some of the principal notions and assertions of Meinong's ontology. A few brief comments on the notion of 'possible object' and on 'semantics' of fiction conclude the essay."

45. ———. 1989. "Ricordando Stanislaw Leśniewski." *Quaderni del Centro Studi per la Filosofia Mitteleuropea* no. 1989 (1):5-47.

Edited by Massimo Libardi

46. ———. 1989. "Formalization of Functionally Complete Propositional Calculus with the Functor of Implication as the Only Primitive Term." *Studia Logica* no. 48:479-494.

"The most difficult problem that Leśniewski came across in constructing his system of the foundations of mathematics was the problem of 'defining definitions', as he used to put it. He solved it to his satisfaction only when he had completed the formalization of his protothetic and ontology. By formalization of a deductive system one ought to understand in this context the statement, as precise and unambiguous as possible, of the conditions an expression has to satisfy if it is added to the system as a new thesis. Now, some protothetical theses, and some ontological ones, included in the respective systems, happen to be definitions. In the present essay I employ Leśniewski's method of terminological explanations for the purpose of formalizing Łukasiewicz's system of implicational calculus of propositions, which system, without having recourse to quantification, I first extended some time ago into a functionally complete system. This I achieved by allowing for a rule of 'implicational definition', which enabled me to define any proposition forming functor for any finite number of propositional arguments."

47. Lepage, François. 2000. "Partial Monotonic Protothetics." *Studia Logica* no. 66:147-163.

"This paper has four parts. In the first part, I present Leśniewski's protothetics and the complete system provided for that logic by Henkin. The second part presents a generalized notion of partial functions in propositional type theory. In the third part, these partial functions are used to define partial interpretations for protothetics. Finally, I present in the fourth part a complete system for partial protothetics. Completeness is proved by Henkin's method using saturated sets instead of maximally saturated sets. This technique provides a canonical representation of a partial semantic space and it is suggested that this space can be interpreted as an epistemic state of a non-omniscient agent."

48. Luschei, Eugene. 1962. *The Logical Ssystems of Leśniewski*. Amsterdam: North-Holland.

49. Miéville, Denis. 1984. *Un Développement Des Systèmes Logiques De Stanislaw Leśniewski: Protothétique, Ontologie, Méréologie*. Berne: Peter Lang.

50. ———. 1985. "Un Aperçu Des Caractéristiques Et De L'esprit Des Systèmes Logiques De Stanislaw Leśniewski." *Dialectica* no. 39:166-179.

"This article provides an introduction to the deductive theories, which are so little known, of S. Leśniewski. The reasons that led this Polish logician to develop a

theory of collective classes as well as the logical theories that underlie it are set forth here, and the main characteristics of Leśniewski's three systems -- mereology, protothetics and ontology -- are presented. Some epistemological considerations are included in this study."

51. ———. 1987. "Axiomes Et Définitions Chez Leśniewski: Une Manière Génétique De Développer Les Systèmes Formels." *Theoria* no. 2:285-307.
- "The logical theories of Stanislaw Leśniewski differ profoundly from classical formal systems. Unlike the latter, they do not have an entirely predetermined vocabulary. Nor do they have a determined list of functors of syntactical-semantical categories. Due to formalized directives for definitions, the logics of Leśniewski are constructed progressively, making new theses and consequently functors of new syntactical-semantical categories accessible. In this article we present the genetic aspect associated with these theses-definitions. We also show that the property of creativity makes it possible to bridge some of the fundamental gaps in contemporary classical logics."
52. ———. 2001. "Introduction À L'œuvre De S. Leśniewski. Fascicule I - La Protothétique." *Travaux de Logique (Neuchâtel)*.
53. ———. 2004. "Introduction À L'œuvre De S. Leśniewski. Fascicule II - L'ontologie." *Travaux de Logique (Neuchâtel)*.
54. ———. 2006. "Logique, Ontologie Et Ontologie." *Revue Internationale de Philosophie* no. 61:149-162.
55. ———. 2009. "Introduction À L'œuvre De S. Leśniewski. Fascicule VI - La Métalangue D'une Syntaxe Inscriptiionnelle." *Travaux de Logique (Neuchâtel)*.
56. ———. 2009. "Leśniewski, Negation, and the Art of Logical Subtlety." In *The Golden Age of Polish Philosophy. Kazimierz Twardowski's Philosophical Legacy*, 113-120. Dordrecht: Springer.
57. Peeters, Marc. 2006. "Introduction À L'œuvre De S. Leśniewski. Fascicule IV - L'œuvre De Jeunesse." *Travaux de Logique (Neuchâtel)*.
58. Poli, Roberto, and Libardi, Massimo. 1999. "Logic, Theory of Science, and Metaphysics According to Stanislaw Leśniewski." *Grazer Philosophische Studien* no. 57:183-219.

"Due to the current availability of the English translation of almost all of Leśniewski's works it is now possible to give a clear and detailed picture of his ideas. Leśniewski's system of the foundation of mathematics is discussed. In a brief outline of his three systems Mereology, Ontology and Protothetics his positions concerning the problems of the forms of expression, proper names, synonymity, analytic and synthetic propositions, existential propositions, the concept of logic, and his views of theory of science and metaphysics are sketched. The influence of Mill, Łukasiewicz, Austrian philosophy and especially Petrazycki on his thinking is evaluated and an interpretation is suggested setting him squarely in a tradition of classical Aristotelian logic."

59. Prakeł, Judith. 1983. "A Leśniewskian Re-Examination of Goodman's Nominalistic Rejection of Classes." *Topoi* no. 2:87-98.

60. Prior, Arthur Norman. 1965. "Existence in Leśniewski and in Russell." In *Formal Systems and Recursive Functions*, edited by Crossley, John N. and Dummett, Michael, 149-155. Amsterdam: North Holland Publishing Company.

Proceedings of the Eighth Logic Colloquium. Oxford, July 1963

61. Rickey, Frederick V. 1977. "A Survey of Leśniewski's Logic." *Studia Logica* no. 36:407-426.

62. ———. 1985. "Interpretations of Leśniewski's Ontology." *Dialectica* no. 39:181-192.

"This article proposes to clarify the problem of interpreting Leśniewski's ontology. A distinction is made between two kinds of interpretation: substitutional and "natural". Substitutional interpretation is shown to involve difficulties and limitations. A "natural" ontology, the major principles of which are presented here, is shown to be of considerable interest."

63. Sanders, John T. 1996. "Stanislaw Leśniewski's Logical Systems." *Axiomathes* no. 3:407-415.

64. Schumann, Andrew. 2013. "On Two Squares of Opposition: The Leśniewski's Style Formalization of Synthetic Propositions." *Acta Analytica* no. 28:71-93.

"In the paper we build up the ontology of Leśniewski's type for formalizing synthetic propositions. We claim that for these propositions an unconventional square of opposition holds, where a, i are contrary, a, o (resp. e, i) are contradictory, e, o are subcontrary, a, e (resp. i, o) are said to stand in the subalternation. Further, we construct a non-Archimedean extension of Boolean algebra and show that in this algebra just two squares of opposition are formalized: conventional and the square that we invented. As a result, we can claim that there are only two basic squares of opposition. All basic constructions of the paper (the new square of opposition, the formalization of synthetic propositions within ontology of Leśniewski's type, the non-Archimedean explanation of square of opposition) are introduced for the first time."

65. Simons, Peter M. 1982. "On Understanding Leśniewski." *History and Philosophy of Logic* no. 3:165-191.

Reprinted in: Peter Simons - *Philosophy and logic in Central Europe from Bolzano to Tarski. Selected Essays* - Dordrecht, Kluwer 1992 pp. 227-258.

"This paper assesses those features of Leśniewski's ontology which make it difficult to understand for logicians accustomed to more orthodox systems of logic. It is seen that certain general features of presentation and content can, by selective acceptance or modification, be accommodated with a fairly orthodox viewpoint. The chief difficulty lies in the interpretation of Leśniewski's names, and the constant "'?". Four interpretations are suggested in turn: Leśniewski's names as monadic predicates; as class terms; as common nouns; and as empty singular or plural terms. This last and least orthodox interpretation is argued to be the most suitable, but it is

shown how it can be made to live in harmony with either the common noun or the class interpretation."

66. ———. 1983. "A Leśniewskian Language for the Nominalistic Theory of Substance and Accident." *Topoi* no. 2:99-110.

67. ———. 1984. "A Brentanian Basis for Leśniewskian Logic." *Logique et Analyse* no. 27:297-398.

Reprinted in: Peter Simons - *Philosophy and logic in Central Europe from Bolzano to Tarski. Selected Essays* - Dordrecht, Kluwer 1992 pp. 259-269

68. ———. 1985. "Leśniewski's Logic and Its Relation to Classical and Free Logics." In *Foundations of Logic and Linguistic. Problems and Their Solutions: A Selection of Contributed Papers from the Viith International Congress of Logic, Methodology, and Philosophy of Science, Held in Salzburg from the 11th-16th July, 1983*, edited by Dorn, Georg and Weingartner, Paul, 369-402. New York: Plenum Press.

Reprinted in: Peter Simons - *Philosophy and logic in Central Europe from Bolzano to Tarski. Selected Essays* - Dordrecht, Kluwer 1992 pp. 271-293

69. ———. 1985. "A Semantics for Ontology." *Dialectica* no. 39:193-216.

"This article proposes to clarify the problem of interpreting Leśniewski's Ontology. A distinction is made between the two kinds of interpretation: substitutional and "natural". Substitutional interpretation is shown to involve difficulties and limitations. A "natural" Ontology, the major principles of which are presented here, is shown to be of considerable interest."

70. ———. 1987. *Parts*. Oxford: Clarendons Press.

71. ———. 1992. "Leśniewskian Term Logic." *Lingua e Stile* no. 27:25-45.

"Students of traditional logic, by which I mean the central core of categorical syllogistic with whatever further forms were studied at the time, were drilled in putting the sentences occurring in arguments into «correct logical form», and present-day students do no different when replacing their natural language sentences by the formulas or semiformulas of predicate logic. Both procedures involve doing some violence to natural modes of expression. A sentence like *Whoever flies saves time* must be replaced by something like *Every flier is a time-saver* by traditional logicians and by *For all x: if x flies then x saves time* by modern logicians. As this makes clear, different logical systems may compete in offering prepared forms proximate to a natural specimen, so there may be a real choice as to which system is preferable for a given purpose. This is familiar to observers of modern logic since there are competing logics of definite descriptions, modality, and so on. Of course, if we confine attention just to the opposition between categorical syllogistic and predicate logic, there seems to be no contest. Predicate logic is expressively much the more powerful system, and as these two are the only two logical systems to have enjoyed widespread acceptance as tools for analysing validity of natural arguments, it might seem that only predicate logic remains as a general vehicle for workaday argument assessment. But the large number of introductory logic textbooks which still contain material on categorical syllogistic bears witness to the fact that, within its more limited sphere, the traditional logic of

terms is widely felt to be a more natural and useful alternative to monadic predicate logic. Historical interest alone could not compensate for the inconveniences of introducing two quite different systems, with their different sentential analyses, laws, and terminology, to cover the same ground.

It is apparent that one disadvantage of predicate logic for these purposes is its use of bound individual variables, which natural languages do not have, and which they can simulate and match only by rather tortuous use of pronouns and pronominal phrases. Of course this helps to account for the greater perspicuity of predicate logic once we leave the simplest sentences behind, but at the most elementary level it is a hindrance. The singular term/predicate analysis of simple predications compels common noun phrases and adjectives used attributively to appear as syntactically inseparable parts of predicates, which correspond most closely to verb phrases in natural language. Again, this is not a huge sacrifice, but it is pervasive, is felt to be unnatural, and contributes to beginners' difficulties in learning logic.

So it is worth considering from a practical and pedagogical point of view whether, in order to gain the considerable benefits conferred by predicate logic - quantification, multiple generality, relational predicates - it is necessary to put up with the disagreeable features of standard predicate logic. I shall argue that it is not, and that a more natural and flexible medium for which to prepare natural language sentences and arguments is provided by the term logic invented around 1920 by Stanislaw Leśniewski (1886-1939) and usually known as Ontology. (*)"

(*) The possible confusion of the system of logic with the branch of metaphysics of the same name is not a danger in this context, and in any case I will write the name of the system with a capital letter. Sometimes Ontology is called the Calculus of Names, but this is misleading, since much more than names are involved. It would be nice to have a better name for Ontology.

72. ———. 1994. "Discovering Leśniewski: *Collected Works*." *History and Philosophy of Logic* no. 15:227-235.

"This discussion review examines the English edition of Leśniewski's collected works. Points emphasized include: the early (pre-symbolic) period, the quality of translation and typesettings, and the scandalously outdated bibliography."

73. ———. 2002. "Reasoning on a Tight Budget: Leśniewski's Nominalistic Metalogic." *Erkenntnis* no. 56:99-122.
74. ———. 2006. "Things and Truths: Brentano and Leśniewski, Ontology and Logic." In *Actions, Products, and Things: Brentano and Polish Philosophy*, edited by Chrudzinski, Arkadiusz and Łukasiewicz, Dariusz, 83-106. Frankfurt: Ontos Verlag.
75. Sinisi, Vito. 1961. "Nominalism and Common Names." *Philosophical Review* no. 71:230-235.

"Edwin Allaire, Gustav Bergmann and Reinhardt Grossmann have objected to the nominalistic analysis of "this is red and that is red" which treats "red" as a common name. Such an analysis, they argued, must assimilate the copula in this sentence to the "is" of identity. sinisi claims that this objection is mistaken. Using a logical system developed by Stanislaw Leśniewski, he shows that it is possible to construe "red" as a common name without taking the copula as the "is" of identity."

76. ———. 1966. "Leśniewski's Analysis of Whitehead's Theory of Events." *Notre Dame Journal of Formal Logic* no. 7:323-327.

77. ———. 1969. "Leśniewski and Frege on Collective Classes." *Notre Dame Journal of Formal Logic* no. 10:239-246.

"Between 1927 and 1931 Leśniewski published a series of articles on the foundations of mathematics in the Polish journal *Przegląd Filozoficzny*. 65% of the work is devoted to various axiomatizations of Leśniewski's mereology (a theory of collective classes) while the remainder takes up various related issues. In the third part of this series Leśniewski informally sets forth his notion of a collective class, criticizes certain descriptions of distributive classes, and argues that there is no justification in Frege's statement that the conception of a class as consisting of individuals, so that the individual thing coincides with the unit class, cannot in any case be supported.

Leśniewski's refutation of Frege's statement appears to be unknown to western logicians and philosophers. None of the recent books on Frege (e.g., Angelelli, Egidi, Sternfeld, Thiel, Walker) mentions it. Luschei, in his *The Logical Systems of Leśniewski*, mentions it but does not present it.

My purpose here is to state and explain Leśniewski's refutation in the hope that it will help stimulate interest in his work."

78. ———. 1976. "Leśniewski's Analysis of Russell's Antinomy." *Notre Dame Journal of Formal Logic* no. 17:19-34.

79. ———. 1983. "The Development of Ontology." *Topoi* no. 2:53-62.

80. Slupecki, Jerzy. 1953. "St Leśniewski's Protothetics." *Studia Logica* no. 1:44-111.

81. ———. 1955. "Lesniewski's Calculus of Names." *Studia Logica* no. 3:7-70.

82. ———. 1958. "Towards a Generalized Mereology of Leśniewski." *Studia Logica* no. 8:131-154.

83. Sobocinski, Boleslaw. 1949. "L'analyse De L'antinomie Russellienne Par Leśniewski." *Methodos*.

Published in four parts: I - II - III: vol. 1. (1949) pp. 94-107; 220-228; 308-316; IV: vol. 2 (1950) pp. 237-257.

84. ———. 1960. "On the Single Axioms of Protothetic, I." *Notre Dame Journal of Formal Logic* no. 1:52-73.

85. ———. 1961. "On the Single Axioms of Protothetic, II." *Notre Dame Journal of Formal Logic* no. 2:111-126.

86. ———. 1961. "On the Single Axioms of Protothetic, III." *Notre Dame Journal of Formal Logic* no. 2:129-148.

87. ———. 1967. "Successive Simplifications of the Axiom-System of Leśniewski's Ontology." In *Polish Logic 1920-1939*, edited by McCall, Storrs, 188-200. Oxford: Clarendon Press.

88. Szrednicki, Jan, Rickey, Frederick V., and Czelakowski, Janusz, eds. 1984. *S. Leśniewski's Systems. Ontology and Mereology*. The Hague: Martinus Nijhoff.

Contents: Editorial Note 7; 1. Z. Kruszewski: Ontology without axioms (1925) 9; 2. B. Sobocinski: Leśniewski's analysis of Russell's Paradox (1949) 11; 3. C. Lejewski: Logic and existence (1954) 45; 4. J. Slupecki: S. Leśniewski's Calculus of Names (1955) 59; 5. C. Lejewski: On Leśniewski's Ontology (1958) 123; 6. J. Canty: Ontology: Leśniewski's logical language (1969) 149; 7. B. Iwanus: On Leśniewski's elementary Ontology (1973) 165; 8. B. Sobocinski: Studies in Leśniewski's Mereology (1954) 217; 9. E. Clay: On the definition of mereological class (1966) 229; 10. C. Lejewski: Consistency of Leśniewski's Mereology (1969) 231; 11. E. Clay: The dependence of a mereological axiom (1970) 239; 12. E. Clay - Relation of Leśniewski's Mereology to Boolean algebra (1974) 241; Protothetic bibliography 253; Index of Names 261.

89. Szrednicki, Jan, and Stachniak, Zbigniew, eds. 1998. *Leśniewski's Systems: Protothetic*. Dordrecht: Kluwer.

Contents: Editor's Foreword VII; 1. Peter M. Simons: Nominalism in Poland (1983) 1; 2. V. Frederick Rickey: A survey of Leśniewski's logic (1977) 23; 3. Alfred Tajtelbaum-Tarski: On the primitive term of logistic (1923) 43; 4. Boleslaw Sobocinski: An investigation in Protothetics (1949) 69; 5. Jerzy Slupecki: St. Leśniewski's Protothetics (1953) 85; 6. Boleslaw Sobocinski: On the single axiom of Protothetic (1960) 153; 7. V. Frederick Rickey: Axiomatic inscriptional syntax. Part II. The syntax of Protothetic (1973) 217; VIII. Audoënus Le Blanc: Investigations in Protothetic (1985) 289; Protothetic bibliography 299; Author Index 309.

90. Stachniak, Zbigniew. 1981. *Introduction to Model Theory for Leśniewski's Ontology*. Wrocław: Wydawnictwo Uniwersytetu Wrocławskiego.

91. Strawson, Peter Frederick, and Lejewski, Czeslaw. 1957. "Symposium: Proper Names." *Proceedings of the Aristotelian Society* no. Supplementary vol. 31:191-236.

92. Surma, Stanislaw. 1977. "On the Work and Influence of Stanislaw Leśniewski." In *Logic Colloquium 76*, edited by Gandy, Robin and Hyland, John Martin, 191-220. Amsterdam: North-Holland Publishing Company.

93. Takano, Mitio. 1985. "A Semantical Investigation into Leśniewski's Axiom of His Ontology." *Studia Logica* no. 44:71-77.

94. Trentman, John. 1966. "Leśniewski's Ontology and Some Medieval Logicians." *Notre Dame Journal of Formal Logic* no. 7:361-364.

95. Urbaniak, Rafal. 2008. "Leśniewski and Russell's Paradox: Some Problems." *History and Philosophy of Logic* no. 29:115-146.

"Sobocinski in his paper on Leśniewski's solution to Russell's paradox (*L'analyse de l'antinomie russellienne par Leśniewski*, 1949) argued that Leśniewski has succeeded in explaining it away. The general strategy of this alleged explanation is presented. The key element of this attempt is the distinction between the collective

(mereological) and the distributive (set-theoretic) understanding of the set. The mereological part of the solution, although correct, is likely to fall short of providing foundations of mathematics. I argue that the remaining part of the solution which suggests a specific reading of the distributive interpretation is unacceptable. It follows from it that every individual is an element of every individual. Finally, another Leśniewskian-style approach which uses so-called higher-order epsilon connectives is used and its weakness is indicated."

96. ————. 2013. *Leśniewski's Systems of Logic and Foundations of Mathematics*. Dordrecht: Springer.

"The Lvov-Warsaw school of logic and analytic philosophy was one of the most important schools of philosophical thought in twentieth century. In early 1910s its members already discussed the validity of the principles of excluded middle and contradiction. Among ideas developed in this school one might count Łukasiewicz's view that one can believe a contradiction and that certain sentences can be neither true nor false. This led to the construction of his three-valued logic. Another example is Ajdukiewicz's conventionalism about meaning and his formal work on definitions (it seems that it was Ajdukiewicz and Łukasiewicz who first focused on the consistency, translatability and non-creativity conditions on definitions, at least on the Polish ground). Other examples include Jaśkowski's approach to natural deduction and his work on discussive logics, Lindenbaum's lemma on maximally consistent sets of formulas, Presburger's work on arithmetic, Kotarbiński's semantical reism, and Tarski's work on formal semantics and truth.

One of the representatives of this school was Stanisław Leśniewski (1886–1939) (Alfred Tarski, whose importance in twentieth century logic it is hard to overestimate, was his only PhD student). Leśniewski developed his system of foundations of mathematics as an alternative to the system of *Principia Mathematica*. He constructed three systems: *Protothetic*, which is his version of a generalized propositional calculus, his own (higher-order) logic of predication called *Ontology*, and a theory of parthood called *Mereology*.

This book is devoted to a presentation of Leśniewski's achievements and their critical evaluation. I discuss his philosophical views, describe his systems and evaluate the role they can play in the foundations of mathematics. It was my purpose to focus on primary sources and present Leśniewski's own views and results rather than those present in secondary literature. For this reason, later developments are not treated in detail but rather either mentioned in passing, or described in sections devoted to secondary literature included in some chapters. The intended audience of this book includes philosophy majors, graduate students and professional philosophers interested in logic, mathematics and their philosophy and history."

97. Urbaniak, Rafal, and Severi Hämäri, K. 2012. "Busting a Myth About Leśniewski and Definitions." *History and Philosophy of Logic* no. 33:159-189.

"A theory of definitions which places the eliminability and conservativeness requirements on definitions is usually called the standard theory. We examine a persistent myth which credits this theory to Leśniewski, a Polish logician. After a brief survey of its origins, we show that the myth is highly dubious. First, no place in Leśniewski's published or unpublished work is known where the standard conditions are discussed. Second, Leśniewski's own logical theories allow for creative definitions. Third, Leśniewski's celebrated 'rules of definition' lay merely syntactical restrictions on the form of definitions: they do not provide definitions with such meta-theoretical requirements as eliminability or conservativeness. On the positive side, we point out that among the Polish logicians, in the 1920s and

1930s, a study of these meta-theoretical conditions is more readily found in the works of Łukasiewicz and Ajdukiewicz."

98. Vasyukov, Vladimir. 1993. "A Leśniewskian Guide to Husserl's and Meinong's Jungles." *Axiomathes* no. 4 (1):59-74.
99. Wojciechowski, Eugeniusz. 1994. "Zwischen Der Syllogistik Und Den Systemen Von Leśniewski: Eine Rekonstruktion Der Idee Der Quantifizierung Der Prädikate." *Grazer Philosophische Studien* no. 48:165-200.
100. Wolenski, Jan. 1986. "Reism and Leśniewski's Ontology." *History and Philosophy of Logic* no. 7:167-176.

"This paper examines relations between Reism, the metaphysical theory invented by Tadeusz Kotarbinski, and Leśniewski's calculus of names. It is shown that Kotarbinski's interpretation of common nouns as genuine names, i.e., names of things is essentially based on Leśniewski's logical ideas. It is pointed out that Leśniewskian semantics offers better prospects for Nominalism than does semantics of the standard first-order predicate calculus."

101. ———. 1989. *Logic and Philosophy in the Lvov-Warsaw School*. Dordrecht: Kluwer.
102. ———. 1995. "Leśniewski's Logic and the Concept of Being." *Recherches sur la Philosophie et le Langage*:93-101.

This paper applies Leśniewski's logical ideas to an analysis of the concept of being. The analysis follows the classical ontology which is based on a distinction of two concepts of being : being in the distributive sense and being in the collective sense. Now it is argued that Leśniewski's ontology (calculus of names) is a much better device for analyzing being in the distributive sense than the standard first-order predicate logic. Moreover, basic intuition connected with the being in the collective sense are nicely captured by mereology.

103. Zanasi, Fausto. 1980. "Su Alcuni Aspetti Della Teoria Della Definizione Nei Sistemi Logici Di S. Leśniewski." *Annali dell'Istituto di Discipline Filosofiche dell'Università di Bologna*:219-232.