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

Selected bibliography on Language as Calculus *vs.* Language as Universal Medium

Bibliography

1.   Blanché, Robert. 1970. *La logique et son histoire d'Aristote à Russell*. Paris: Armand Colin.
      See Chapter VIII. Leibniz 1. Situation de Leibniz 189; 2. Logique classique 193; 3. Lingua characteristica universalis 201; 4. Calculus ratiocinator 208-219.

2.   Cocchiarella, Nino. 1988. "Predication versus membership in the distinction between logic as language and logic as calculus." *Synthese* no. 77:37-72.

3.   Cohen, Jonathan. 1954. "On the Project of a Universal Character." *Mind* no. 63:49-63.
      Reprinted in: *Knowledge and Language. Selected Essays of L. Jonathan Cohen,* Edited and with an introduction by James Logue, Dordrecht: Kluwer, 2002 pp. 1-14.
      "During the last thirty years or so the practice has grown up among logicians of attributing the project of a universal character to Leibniz alone among seventeenth century thinkers. This attribution is to be found, for instance, in L. S. Stebbing's *Modern Introduction to Logic*, (1) in Cohen and Nagel's *Introduction to Logic and Scientific Method*, (2) in M. Black's *Nature of Mathematics*, (3) in J. H. Woodger's *Axiomatic Method in Biology*, (4) and in O. Neurath's introductory article in the International Encyclopaedia of Unified Science. (5) And it dates, I suspect, from the publication of C. I. Lewis's *Survey of Symbolic Logic* in 1918. Lewis mentioned that Leibniz acknowledged a debt in this connexion to Raymond Lully, Athanasius Kircher, George Dalgarno and John Wilkins. But he considered their writings contained "little which is directly to the point". (6) In this Lewis was obviously right with regard to Leibniz's conception of a calculus of reasoning, but wrong, as I shall try to show, with regard to the project of a universal character, which seems in fact to have been an intellectual commonplace in seventeenth century Western Europe. This somewhat neglected by-way of philosophical history is worth a brief review, I think, not only in order to fix more precisely the respect in which Leibniz was the only seventeenth century precursor of modern symbolic logicians, but also because it draws attention to an early widespread philosophical muddle about the cónstruction of artificial languages."

4.   Couturat, Louis, and Leau, Leopold. 1903. *Histoire de la langue universelle*. Paris: Hachette.

5.   Dresner, Eli. 1999. "Hintikka's 'Language as calculus vs. language vs. universal medium' Distinction." *Pragmatics and Cognition* no. 7:405-421.

6.   Eco, Umberto. 1995. *The Search for the Perfect Language*. Oxford: Blackwell. Translated by James Fentress from the Italian: *La ricerca della lingua perfetta nella cultura europea,* Bari: Laterza, 1993.

7.   Hartimo, Mirja. 2006. "Logic as a Universal Medium or Logic as a Calculus? Husserl and the Presuppositions of "the Ultimate Presupposition of Twentieth Century Philosophy"." *Southern Journal of Philosophy* no. 44:569-580.
      "This paper discusses Jean van Heijenoort's (1967) and Jaakko and Merrill B. Hintikka's (1986, 1997) distinction between logic as a universal language and logic as a calculus, and its applicability to Edmund Husserl's phenomenology. Although it is argued that Husserl's phenomenology shares characteristics with both sides, his

view of logic is closer to the model-theoretical, logic-as-calculus view. However, Husserl's philosophy as transcendental philosophy is closer to the universalist view. This paper suggests that Husserl's position shows that holding a model-theoretical view of logic does not necessarily imply a calculus view about the relations between language and the world. The situation calls for reflection about the distinction: It will be suggested that the applicability of the van Heijenoort and the Hintikkas distinction either has to be restricted to a particular philosopher's views about logic, in which case no implications about his or her more general philosophical views should be inferred from it; or the distinction turns into a question of whether our human predicament is inescapable or whether it is possible, presumably by means of model theory, to obtain neutral answers to philosophical questions. Thus the distinction ultimately turns into a question about the correct method for doing philosophy."

8.   Heijenoort, Jean van. 1967. "Logic as Calculus and Logic as Language." *Synthese* no. 17:324-330.
     Reprinted in:
     - R.S. Cohen & M.W. Wartofsky (editors), *Boston Studies in the Philosophy of Science,* vol. 3: *In Memory of Norwood Russell Hanson, Proceedings of the Boston Colloquium on Philosophy of Science, 1964/1965*, Dordrecht: Reidel, 1967, pp. 440-446;
     - Jean van Heijenoort, *Selected Essays* - Napoli: Bibliopolis, 1985, pp. 11-16;
     - Jaakko Hintikka, *Lingua Universalis vs. Calculus Ratiocinator. An Ultimate Presupposition of Twentieth-Century Philosophy,* Dordrecht: Kluwer, 1997, pp. 233-239.

9.   ———. 1977. "Set-theoretic semantics." In *Logic Colloquium '76*, edited by Gandy, Robin O. and Hyland, John M.E., 183-190. Amsterdam: North-Holland.

10. Hintikka, Jaakko. 1997. *Lingua Universalis vs. Calculus Ratiocinator. An Ultimate Presupposition of Twentieth-Century Philosophy*. Dordrecht: Kluwer.
     Contents: Origin of the essays VII; Introduction IX-XXII; 1. Contemporary philosophy and the problem of truth 1; 2. Is truth ineffable? 20; 3. Defining truth, the whole truth and nothing but the truth 46; 4. On the development of the model-theoretic viewpoint in logical theory 104; 5. The place of C. S. Peirce in the history of logical theory 140; 6. (with Merrill B. Hintikka): Wittgenstein and language as the universal medium 162; 7. Carnap's work in the foundations of logic and mathematics in a historical perspective 191; 8. Quine as a member of the tradition of the universality of language 214; Appendixes. 1. Jean van Heijenoort: Logic as calculus and logic as language 233; 2. Martin Kusch: Husserl and Heidegger on meaning 240-268.
     "Of these essays, 1 and 5 are being published elsewhere at the same time but have not been published before. Essays 2, 4 and 6-8 are published without any changes. For technical reasons, it has not been feasible to make them completely uniform typographically or to bring their references completely up to date. Essay 3, which is the mainstay of the argumentation of this volume, has been revised for republication. In particular, its sections 9 and 12 have been thoroughly rewritten."

11. Peckhaus, Volker. 2004. "Calculus ratiocinator versus characteristica universalis? The two traditions in logic, revisited." *History and Philosophy of Logic* no. 25:3-14.

12. Rossi, Paolo. 2000. *Logic and the Art of Memory. The Quest for a Universal Language*. Chicago: University of Chicago Press.
     Translated from the Italian: *Clavis universalis: arti mnemoniche e logica combinatoria da Lullo a Leibniz*, Milano: Ricciardi, 1960 (second revised edition, Bologna, Il Mulino, 1983) with an introduction by Stephen Clucas.

13. Scholz, Heinrich. 1961. *Concise History of Logic*. New York: Philosophical Library.
     Translated from: *Abriss der Geschichte der logik* (1931) by Kurt F. Leidecker.

14. Smith, Barry. 1990. "Characteristica Universalis." In *Language, truth and ontology*, edited by Mulligan, Kevin, 50-81. Dordrecht: Kluwer.
"Our task will be to construct portions of a directly depicting language which will enable us to represent the most general structures of reality. We shall draw not on standard logical treatments of the contents of epistemic states as these are customarily conceived in terms of propositions. Rather, we shall turn to a no less venerable but nowadays somewhat neglected tradition of formal ontology: not sentences or propositions, but maps, diagrams or pictures, shall serve as the constituents of our mirror of reality."

15. Swanson, J.W. 1965. "On the calculus ratiocinator." *Inquiry* no. 8:315-331.

16. Vilkko, Risto. 2002. *A Hundred Years of Logical Investigations: Reform Efforts of Logic in Germany 1781-1879*. Paderborn: Mentis Verlag.

17. Burkhardt, Hans. 1980. *Logik und Semiotik in der Philosophie von Leibniz*. München: Philosophia Verlag.
See in particular: 3.04 *Die Charakteristik* pp. 186-205.

18. ———. 1987. "The Leibnizian *Characteristica Universalis* as Link Between Grammar and Logic." In *Speculative Grammar, Universal Grammar, and Philosophical Analysis of Language*, edited by Buzzetti, Dino and Ferriani, Maurizio, 43-63. Amsterdam: Benjamins.

19. Couturat, Louis. 1901. *La logique de Leibniz: d'aprés des documents inédits*. Paris: Felix Alcan.
Reprinted: Hildesheim, Olms, 1961 e 1985.

20. Heinekamp, Albert. 1972. "Ars characteristica und natürliche Sprache bei Leibniz." *Tijdschrift voor Filosofie* no. 34:446-488.
"One can distinguish two different approaches toward language in Leibniz's work. On one hand, he considers natural language insufficient and would like to replace it by a 'rational' language (*lingua philosophica*), while on the other hand, he is an empirical researcher of language who collects phenomena from the most diverse languages in order to compare them with other languages. The literature about Leibniz highlights only these two aspects of his work, and usually considers them to be incompatible. The relationship between Leibniz's remarks about '*characteristica universalis*' and his theories about natural language is explored. Even though Leibniz did not produce an explicit theory about this relationship, a difference between these two is clearly implied in his remarks. Natural language and characteristica are to Leibniz, basically different in their existence, their function, and their performance. Nevertheless, they both form integral components of Leibniz's monad theory."

21. Hernández Márquez, Victor Manuel. 1999. "Leibniz y la lingua characterica." *Diánoia.Anuario de Filosofía* no. 45:35-63.

22. Lenzen, Wolfgang. 2004. *Calculus universalis. Studien zur Logik von G. W. Leibniz*. Paderborn: Mentis Verlag.

23. O'Briant, Walter. 1994. "Leibniz's Europeanism and the characteristica universalis." In *Leibniz und Europa. VI. Internationaler Leibniz-Kongress. Vorträge. 1. Teil*, 541-543. Hannover: Gottfried-Wilhelm-Leibniz-Gesellschaft.

24. Patzig, Günther. 1969. "Leibniz, Frege und die sogenannte '*lingua characteristica universalis*'." *Studia Leibnitiana.Supplementa*:103-112.
Akten des Internationale Leibniz-Kongresses Hannover 14-19 November 1966 - Vol. 3: Erkenntnislehre, Logik, Sprachphilosophie, Editionsberichte.

25. Peckhaus, Volker. 1997. *Logik, Mathesis universalis und allgemeine Wissenschaft: Leibniz und die Wiederentdeckung der formalen Logik im 19. Jahrhundert*. Berlin: Akademie Verlag.
Contents: Vorwort VII-VIII; 1. Einleitung 1; 2. Die Idee der *mathesis universalis* bei Leibniz 25; 3. Die frühe Rezeption Leibnizscher *mathesis universalis* und Logik

64; 4. Die "logische Frage" und die Entdeckung der Leibnizschen Logik 130; 5. Leibniz und die englische Algebra der Logik 185; 6. Ernst Schröder: "Absolute Algebra" und Leibnizprogramm 233; 7. Schluss 297; Verzeichnisse 309-412.

26. Rossi, Paolo. 1989. "The Twisted Roots of Leibniz' Characteristic." In *The Leibniz Renaissance*, 271-289. Firenze: Olschki.

27. Schneider, Martin. 1994. "Leibniz' Konzeption der "*characteristica universalis*" zwischen 1677 und 1690." *Revue Internationale de Philosophie* no. 48:213-236.

28. Goldfarb, Warren. 2001. "Frege's Conception of Logic." In *Future Pasts. The Analytic Tradition in Twentieth Century Philosophy*, edited by Floyd, Juliet and Shieh, Sanford, 25-41. Oxford: Oxford University Press.
"The first task is that of delineating the differences between Frege's conception of logic and the contemporary one. I shall start with the latter. Explicit elaborations of it are surprisingly uncommon. (In most writing on issues in philosophical logic, it is implicitly assumed; yet many textbooks gloss over it, for one pedagogical reason or another.) There are various versions; I will lay out the one formulated by Quine in his textbooks (1) as it seems to me the clearest.
On this conception, the subject matter of logic consists of logical properties of sentences and logical relations among sentences. Sentences have such properties and bear such relations to each other by dint of their having the logical forms they do. Hence, logical properties and relations are defined by way of the logical forms; logic deals with what is common to and can be abstracted from different sentences. Logical forms are not mysterious quasi-entities, à la Russell. Rather, they are simply schemata: representations of the composition of the sentences, constructed from the logical signs (quantifiers and truth-functional connectives, in the standard case) using schematic letters of various sorts (predicate, sentence, and function letters). Schemata do not state anything and so are neither true nor false, but they can be interpreted: a universe of discourse is assigned to the quantifiers, predicate letters are replaced by predicates or assigned extensions (of the appropriate r-ities) over the universe, sentence letters can be replaced by sentences or assigned truth-values. Under interpretation, a schema will receive a truth-value. (pp. 25-26)
(...)
Such a schematic conception is foreign to Frege (as well as to Russell). This comes out early in his work, in the contrast he makes between his *Begriffsschrift* and the formulas of Boole: "My intention was not to represent an abstract logic in formulas, but to express a content through written signs in a more precise and clear way than it is possible to do through words." (2) And it comes out later in his career in his reaction to Hilbert's *Foundations of Geometry:* "The word 'interpretation' is objectionable, for when properly expressed, a thought leaves no room for different interpretations. We have seen that ambiguity [*Vieldeutigkeit*] simply has to be rejected." (3) There are no parts of his logical formulas that await interpretation. There is no question of providing a universe of discourse. Quantifiers in Frege's system have fixed meaning: they range over all items of the appropriate logical type (objects, one place functions of objects, two place functions of objects, etc.). (p. 27)
(...)
On Frege's *universalist conception,* then, the concern of logic is the articulation and proof of logical laws, which are universal truths. Since they are universal, they are applicable to any subject matter, as application is carried out by instantiation. For Frege, the laws of logic are general, not in being about nothing in particular (about forms), but in using topic-universal vocabulary to state truths about everything. (p. 28)
(...)
My central aims in this paper have been to delineate Frege's universalist conception of logic and contrast it with a more familiar one, to show that this conception connects with many other points in Frege's philosophy, and to suggest that the conception is a well-motivated one, given the nature of Frege's project. Of course, today most of us would find the schematic conception (or some variant of it) far

more natural, if not unavoidable. But I hope to have caused us to reflect on how much else has to shift in order to make it." (p. 41)
(1) *Elementary Logic* (Boston: Ginn, 1941) and *Methods of Logic* (New York: Holt, 1950).
(2) "Über den Zweck der Begriffsschrift," *Jenaische Zeitschrift far Naturwissenschaft 16,* Supplement (1882): 1-10, p. 1
(3) "Über die Grundlagen der Geometrie," *Jahresbericht der Deutschen Mathematiker Vereinigung* 15 (1906): 293-309, 377-403, 423-430, p. 384.

29. Haaparanta, Leila. 1985. *Frege's Doctrine of Being*. Helsinki: Acta Philosophica Fennica.

30. ———. 1988. "Analysis as the method of logical discovery: some remarks on Frege and Husserl." *Synthese* no. 77:73-98.

31. Hintikka, Jaakko. 1979. "Frege's Hidden Semantics." *Revue Internationale de Philosophie* no. 33:716-722.
"From my observations, several corollaries follow for the recent discussions concerning Frege in the literature.
For instance, the truly interesting historical problem is not to find anticipations of Frege on sense and reference in earlier philosophers or, more generally, to study Frege's theory in its relation to his predecessors. The fascinating novelty which I for one would very much like to understand better is how Frege came upon his ideas about extensional logic, ideas which were radically different from the great majority of traditional philosophers. Furthermore, the deep objects of comparison and contrast in twentieth-century philosophy are not later theories of senses (or their partial dispensability as in Kripke) or other theories of intensional contexts but those recent findings which challenge Frege's treatment of first-order logic.
Among these targets of challenge, the most important ones are probably the paucity of Frege's ontology (set of categories represented by his primitive symbols), the so-called Frege principle (1), and the Frege-Russell claim that ordinary-language words like the English "is" and the German "ist" are ambiguous between the "is" of existence, identity, predication, and subsumption (2). In some ways, the true import of Frege's tacit first-order semantics is best seen from the criticisms to which these three cornerstones of Frege's semantics have been subjected." p. 722
(1) See here my paper "Theories of Truth and Learnable Languages" (forthcoming). [Stig Kanger and Sven Öhman (eds.) - Philosophy and grammar: papers on the occasion of the Quincentennial of Uppsala University - Dordrecht, D. Reidel Publishing Company, 1981 pp. 37-58]
(2) See my paper, "'Is', Semantical Games, and Semantical Relativity." Journal of Philosophical Logic. vol. 8 (1979), 433-468.

32. ———. 1981. "Semantics: A Revolt Against Frege." In *Contemporary Philosophy. Vol. I. Philosophy of Language*, edited by Floistad, Guttorm, 57-82. The Hague: Martinus Nijhoff.

33. ———. 1984. "A Hundred Years Later: The Rise and Fall of Frege's Influence in Language Theory." *Synthese* no. 59:27-49.

34. Kluge, Eike Henner W. 1977. "Frege, Leibniz "et alii"." *Studia Leibnitiana* no. 9:266-274.
"Patzig has argued that Frege's use of the phrase 'lingua characterica' constitutes an insufferable pleonasm that no-one with first-hand knowledge of Leibniz's writings would have committed. On this he bases an argument to show that Frege's knowledge of Leibniz was weak and garnered from secondary sources. I show that this claim ignores certain crucial Leibniz quotes by Frege which he could have found only in the Gerhardt edition of Leibniz's mathematical works and his correspondence, and lay the foundation for an analysis of the historical influence of Leibniz on the development of Frege's thought."

35. ———. 1980. "Frege, Leibniz and the notion of an ideal language." *Studia Leibnitiana* no. 12:140-154.

"This paper examines the question, whether and to what degree Leibniz's project of an ideal language -- of a "lingua characterica" which at the same time can also function as a "calculus ratiocinator" -- had an influence on Frege's project of a "Begriffsschrift". It concludes that not only are there sufficient conceptual similarities to warrant an hypothesis of historical connection, but that there are also historical indications in Frege's own writings to that effect."

36. Sluga, Hans. 1987. "Frege against the Booleans." *Notre Dame Journal of Formal Logic* no. 28:80-98.

37. Banchetti-Robino, Marina. 1997. "Husserl's Theory of Language as Calculus Ratiocinator." *Synthese* no. 112:303-321.
"This paper defends an interpretation of Husserl's theory of language, specifically as it appears in the Logical Investigations, as an example of a larger body of theories dubbed `language as calculus'. Although this particular interpretation has been previously defended by other authors, such as Hintikka and Kusch, this paper proposes to contribute to the discussion by arguing that what makes this interpretation plausible are Husserl's distinction between the notions of meaning-intention and meaning-fulfillment, his view that meaning is instantiated through meaning-intending acts of transcendental consciousness, and his view that the content of meaning-intending acts is ideal meaning simpliciter. As well, the paper argues that the phenomenological method of reduction itself presupposes the notion that reality as such can be reached by subtracting the influence of the language of the natural attitude and its ontological commitments and it, thus, presupposes the conception of language as a reinterpretable calculus." (p. 303)

38. Bar-Hillel, Yehoshua. 1956. "Husserl's conception of a purely logical grammar." *Philosophy and Phenomenological Research* no. 17:362-369.
Reprinted in: Aspects of language. Essays and lectures on philosophy of language, linguistic philosophy and methodology of linguistics - Jerusalem - The Magnes Press - The Hebrew University, 1970 pp. 89-97.
Reprinted also in: Jitendra Nath Mohanty - Readings on Husserl's Logical Investigations - The Hague - Martinus Nijhoff 1977 pp. 128-137.

39. Ferriani, Maurizio. 1983. "Boole, Frege e la distinzione leibniziana 'Lingua-Calculus'." In *Atti del convegno internazionale di storia della logica*, edited by Abrusci, Michele, Casari, Ettore and Mugnai, Massimo, 301-306. Bologna: CLUEB.
Versione ampliata in: Maurizio Ferriani - *Logica e filosofia della logica. Studi su Boole e Peirce* - Bologna, CLUEB, 1999 pp. 3-26.

40. Goldfarb, Warren. 1979. "Logic in the Twenties: the nature of the quantifier." *Journal of Symbolic Logic* no. 44:351-368.

41. Hintikka, Jaakko. 1981. "Wittgenstein's Semantical Kantianism." In *Ethics: Proceedings of the Fifth International Wittgenstein Symposium, 25-31 August 1980, Kirchberg am Wechsel, Austria*, edited by Morscher, Edgar and Stranzinger, Rudolf, 375-390. Wien: Hölder-Pichler Tempsky.

42. ———. 1988. "On the Development of the Model-Theoretic Viewpoint in Logical Theory." *Synthese* no. 77:1-36.

43. ———. 1997. "The Place of C. S. Peirce in the History of Logical Theory." In *The Rule of Reason. The Philosophy of Charles Sanders Peirce*, edited by Brunning, Jacqueline and Forster, Paul, 13-33. Toronto: Toronto University Press.

44. Hintikka, Jaakko, and Hinitkka, Merrill. 1986. "Wittgenstein and Language as the Universal Medium." In *Investigating Wittgenstein*, 1-29. Oxford: Blackwell.
Reprinted in: *Lingua Universalis vs. Calculus Ratiocinator. An Ultimate Presupposition of Twentieth-Century Philosophy* pp. 162-190.

45. Kusch, Martin. 1988. "Husserl and Heidegger on meaning." *Synthese* no. 77:99-127.

Reprinted in: Jaakko Hintikka, *Lingua Universalis vs. Calculus Ratiocinator. An ultimate presupposition of Twentieth-century philosophy*, Dordrecht: Kluwer, 1997, pp. 240-268.

46.   ———. 1989. *Language as Calculus vs. Language as Universal Medium. A Study in Husserl, Heidegger, and Gadamer*. Dordrecht: Kluwer.
Contents: Preface IX-XI; Part I. Introduction: Language as calculus vs. language as the universal medium 1; Part II. Husserl's phenomenology and language as calculus 11; Part III. Heidegger's ontology and language as the universal medium 135; Part IV. Between Scylla and Charybdis -- Gadamer's hermeneutics 229; Notes to Part I 259; Notes to Part II 260; Notes Part III 290; Notes to Part IV 310; Bibliography 315; Index of names 343; Index of subjects 353.

47.   Proops, Ian. 2007. "Russell and the Universalist conception of logic." *Noûs* no. 41:1-32.

48.   Schõfer, Erasmus. 1972. "Heidegger's Language: Metalogical Forms of Thought and Grammatical Specialities." In *On Heidegger and Language*, edited by J., Kockelmans Joseph, 281-301. Evanston: Northwestern University Press. Translated from German by Joseph J. Kockelmans.

49.   Wolenski, Jan. 1998. "Husserl and the development of semantics." *Philosophia Scientiae* no. 3:151-158.
"This paper investigates the role of Edmund Husserl in the development of formal or model-theoretic semantics through glasses of the distinction of language as calculus vs. language as universal medium, introduced by Jaakko Hintikka and Martin Kusch. In particular, the paper raises the question of possible Husserl's influence on the conception of language accepted in Polish philosophy, in particular by Lesniewski and Tarski."

Related pages

On the website "Theory and History of Ontology" (www.ontology.co)

Language as Calculus vs. Language as Universal Medium

Mathesis Universalis: the Search for a Universal Science