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Selected bibliography on Bernard Bolzano's Contributions to Logic and Ontology. Third Part: Gie - L

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Studies on Bolzano's Logic and Ontology

1. Gieske, Carsten Uwe. 1997. "Bolzano's Notion of Testifying." *Grazer Philosophische Studien* no. 53:249-266
    Abstract: "The notion of testifying (or testimony) is the central notion of Bolzano's theory of communication. In his Wissenschaftslehre (Theory of Science) Bolzano gives an analysis of this notion. It shows surprising parallels to Paul Grice's attempt to define "A meantNN something by x". I will begin with an explanation of some parts of the analysis and continue with an investigation of the relationship between Bolzano's analysis and that of Grice. In conclusion I would like to present some evidence supporting the hypothesis that several of the virtues of Grice's theory had already been developed by Bolzano, whose approach even has the advantage of a better definition than Grice's, as Bolzano's analysis provides a better basis for defining a notion of successful communication of information."

2. Grossmann, Reinhardt. 1961. "Frege's Ontology." *Philosophical Review* no. 70:23-40
    Reprinted in: E. D. Klemke, *Essays on Frege*, Urbana: University of Illinois Press 1968, pp. 79-98.
    On Bolzano see pp. 23-27.
    "I begin by describing some features of Bolzano's *Wissenschaftslehre*, for much of what I shall have to say about Frege can best be understood against the background of Bolzano's view.(4) According to Bolzano, all things are of one of three kinds: First, there are different kinds of mental states (*subjective Vorstellungen*), namely, (a) individual ideas (*subjective Einzelvorstellunge*n), (b) general ideas (*subjective Allgemeinvorstellungen*), and (c) thoughts (*gedachte Saetze*). Things of these three kinds are supposed to exist in individual minds; in this respect they are "subjective" rather than "objective."(5) Second, there are so-called objects$_1$ (*Gegenstaend*e), namely, (a) individual things and (b) properties (*Beschaffenheiten and Relationen*). These things are not in any individual mind, but exist independently of minds and are therefore "objective" rather than "subjective."(6)
    Third, there are senses (*objective Vorstellungen*), namely, (a) individual concepts (*objective Einzelvorstellungen*), (b) general concepts (*objective Allgemeinvorstellungen*), and (c) propositions (*Saetze an sich*). These things differ from mental states in that they are as "objective" as objects$_1$. >But they also differ from the latter. One important difference is that they are more closely connected with mental states than are objects$_1$. (7)" (pp. 23-24)
    (4) Bolzano, *Wissenschaftslehre* (new ed., 4 vols.; Leipzig, 1929). Compare also Y. Bar-Hillel, "Bolzano's Definition of Analytic Propositions," *Methodos*, II (1950), 32-55; and H. R. Smart, "Bolzano's Logic," *Philosophical Review,* LIII (I944), 513-533.
    (5) *Wissenschaftslehre*, I, 77, 99, 219.
    (6) *Ibid*., pp. 219-222, 331, 378-387.
    (7) *Ibid*., pp. 2I6-2I8.

3. Hafner, Johannes. 2000. "Bolzano's Criticism of Indirect Proofs." *Revue d'Histoire des Sciences* no. 52:385-399
    Abstract: "The bearing of *Ableitbarkeit* and the compatibility requirement on the possibility of indirect proofs in Bolzano's logic has frequently been misconstrued. Without additional assumptions concerning the logical structure of indirect proofs

and the relationship between proofs and *Ableitbarkeit* the compatibility requirement does not in general preclude indirect proofs. Bolzano's own objections to them are raised in the context of *Abfolge*, not *Ableitbarkeit*. Closer inspection shows that there are in fact two distinct criticisms in play. Identifying and analyzing them clarifies what exactly Bolzano views as the problem of indirect proofs."

4.   Hale, Bob, and Wright, Crispin. 2015. "Bolzano's Definition of Analytic Propositions." *Grazer Philosophische Studien*:325-364
Abstract: "We begin by drawing attention to some drawbacks of what we shall call the Frege-Quine definition of analytic truth. With this we contrast the definition of analytic propositions given by Bolzano in his *Wissenschaftslehre*.
If Bolzano's definition is viewed, as Bolzano himself almost certainly did not view it, as attempting to capture the notion of analyticity as truth-in-virtue-of-meaning which occupied centre stage during the first half of the last century and which, Quine's influential assault on it notwithstanding, continues to attract philosophical attention, it runs into some very serious problems. We argue that Bolzano's central idea can, nevertheless, be used as the basis of a new definition which avoids these problems and possesses definite advantages over the Frege-Quine approach. Our itle notwithstanding, we make no claim to contribute to the exegesis of Bolzano's thought and works, which we must leave to those more expert in these matters than we are. Naturally, we have done our best not to misrepresent Bolzano's views, and believe we have avoided doing so. But it bears emphasis that it is no part of our intention to suggest that the modifications to his definition which we propose would have had any appeal for him, or that he had, or would have had, any sympathy with the project which motivates them."

5.   Haller, Rudolf. 1992. "Bolzano and Austrian Philosophy." In *Bolzano's Wissenschaftslehre 1837-1987. International Workshop*, 191-206. Firenze: Leo S. Olschki
"It would be fruitful to compare in detail some of the formulations in Twardowski, Husserl, Meinong, Mier, and Kerry, with the original work of Bolzano, a task which cannot be done here. That we cannot rely in all cases on a clear-cut causal relation from reading Bolzano to the adoption of his arguments may not wonder us. To speak about an entire tradition is always a tricky thing, since traditions are not easily to be identified. But if we may use the expression `tradition' then part of a philosophical tradition is that its main tenets recur in different writings and the same or at least similar methods are applied. The fact, however, that even the philosophers of the Vienna Circle claimed to be part of this tradition has been overlooked for a long time. After all, *logical empiricism* was only one of the labels they accepted. Neurath's preferred name «rational empiricism» is somewhat nearer to what was the significant principle of Austrian philosophy. It was the attempt to base the system of science on an ontology of objects. For both fields the tradition starting with Bolzano provided a good basis to build up a philosophical program.
To investigate how many of the philosophers of this tradition came to similar conceptions under an influence of Bolzanoan ideas *without a wider knowledge of his work* and to *explain,* how at the same time we find a strong impact of this conception in different philosophers will remain a task for further research." (pp. 205-206).

6.   Jaray, Kimberly. 2006. "Reinach and Bolzano: Towards A Theory of Pure Logic." *Symposium.Journal of the Canadian Society for Continental Philosophy* no. 10:473-502
"The work of Adolf Reinach (1883-1917) on states of affairs, judgment, and speech acts bears striking similarities to Bernard Bolzano's work in the area of general logic. It is my belief that these similarities suggest that Reinach used Bolzano's logical work to assist with his own. Three considerations support this view. First, Bolzano's work in *Die Wissenschaftslehre* (Theory of Science) was considered by Husserl to be the necessary foundation for any work in logic. Second, Bolzano's logic was a suitable alternative to Immanuel Kant's in that he formulated his

essential relations as inexistent yet real, not Platonic or belonging to a transcendental realm. Third, Reinach did not openly criticize Bolzano in the manner he did the Austrians of the Brentano school, suggesting that Bolzano's logic was more complementary with his own. Due to his untimely death in 1917, Reinach's work on states of affairs and logic remains incomplete, some of it even lost or destroyed. I shall here offer a few brief remarks about Husserl as he was Reinach's mentor and friend, but an in depth discussion of the differences between Reinach and Husserl will not be offered in this paper. Secondary literature tells us that Reinach admired Husserl's *Logical Investigations*, in which phenomenology was said to concern itself with "primarily the discovery of the terra firma of pure logic, of the *Sachen* (things) in the sense of objective entities in general and of general essences in particular," and further "this phenomenology must bring to pure expression, must describe in terms of their essential concepts and their governing formulae of essence, the essences which directly make themselves known in intuition, and the connections which have their roots purely in such essences." These acts of discovering and describing essences or things themselves became the foundation of Reinach's realist ontology: things themselves surround us in the world and our access to them does not require a transcendental turn. It was precisely this realist foundation that allowed Reinach to develop and extend his phenomenological work to logic, legal philosophy, and speech acts as well. This conception of the nature and goal of phenomenology allowed Reinach and other phenomenologists a manner in which to analyze experience with its essential connections without either falling prey to psychologism or resorting to Platonism: phenomenology for them was truly a realist alternative." (p. 473)

7.   Kasabova, Anita. 2002. "Is Logic a Theoretical or Practical Discipline? Kant and / or Bolzano." *Archiv für Geschichte der Philosophie* no. 84:319-333
"Does logic describe something or not? If not, is it a normative or practical discipline? Is there a radical division between the practical or normative level and the theoretical or descriptive level? A discipline is theoretical, we may say, if its main propositions contain descriptive expressions, such as "is" or "have", but no normative expressions, such as "ought", "ought not" or "may". A discipline is normative if its main propositions are of the form "it ought to be". Theoretical propositions express what is, whereas practical propositions express what should be. So a theoretical discipline is descriptive and a normative discipline is prescriptive, but what does a theoretical discipline describe?
According to one view, logic is only theoretical and only describes how things are. Logic as a purely theoretical discipline can then be said to be about mental or linguistic activities, or about non-temporal entities and their non-natural connections, such as entailment or derivability. The practical alternative of this purely theoretical view is that logic is only a practical discipline. Its propositions tell us how we may, should or should not judge and reason. Logic as a normative discipline states norms for human activities. According to another view, logic is primarily a theoretical discipline and its counterpart says that logic is primarily a practical discipline. Yet another view of logic says that it can be conceived as both theoretical and practical." (p. 319).
"Which view of logic does Bolzano take? Whereas Husserl insists on delineating a separate pure logic, Bolzano's Theory of Science combines theoretical and practical logic. Unlike Husserl and contrary to Kant, Bolzano claims that logic as a theory of science, must have both a theoretical and a practical character. Bolzano's wide understanding of logic as a Wissenschaftslehre or doctrine of how to present sciences (WL I, § 1) extends to epistemology and methodology, including didactic and methodological rules for classifying and teaching the sciences. These latter are collections of truths (WL I, § 1) and it is the practical task of a theory of science or logic to direct our acquaintance with these collections of true propositions. Bolzano even claims that logic in this wide sense is essentially a normative discipline, which depends on psychology (WL I, § 11) (21) and that logic proper (22) is a

methodology containing laws that regulate our acquisition of knowledge (WL I, § 15.2) (23)." (p. 326).
(21) Cf. also Heinrich Fels, "Die Philosophie Bolzanos", Philosophisches Jahrbuch der Görres-Gesellschaft, vol. 40, pp. 319-448, 1927, pp.319-448).
(22) Bolzano calls the 4th part of the *Theory of Science* "Eigentliche Wissenschaftslehre".
(23) Cf. Heinrich Scholz, *Die Wissenschaftslehre Bolzanos*, Verlag Oeffentliches Leben, Berlin.1937, p.421.

8.　　　　———. 2004. "Colour Sensations and Colour Qualities: Bolzano Between Modern and Contemporary Views." *British Journal for the History of Philosophy* no. 12:247-276
"What are colour sensations? Sensations are the basic constituents of our perceptual states. They are primitive mental events and are usually distinguished from the conceptual component of more complex mental states, such as beliefs or judgements. For instance, we may see a certain colour or hear a sound without understanding what it is, but we do not remember a colour or sound, nor believe that there is a colour such as tawny, or want to hear a certain sound, without having some idea of what it is." (p. 247)
(...)
"How does Bolzano distinguish between colour sensations and colour qualities? He explains the fact that we have colour sensations by assuming that these latter are caused by real properties of objects and, in the *Wissenschaftslehre* and the *Athanasia*, he claims that colours are dispositional properties or secondary qualities. His causal thesis on colour perception is that colours are properties or attributes of things and we assume that these properties are the cause of our colour sensations and the reason for our judgements that we are seeing coloured things.(12)
His claim that colours are dispositional qualities underlies his examination of physical experiments on colours, which I reconstruct in the next but one section. I then bring the implications of his view into the contemporary discussion of whether colours are dispositional or physical qualities of objects." (p 249)
(12) *Aetiologie*, in *Mathematische und Philosophische Schriften 1810–1816,* BBGA, 2, Nachlass A, vol. 5. §§ 14–15.

9.　　　　———. 2006. "Bolzano's Semiotic Method of Explication." *History of Philosophy Quarterly* no. 23:21-39
"This paper is programmatic: it presents a so-far undiscussed part of Bolzano's *Theory of Science*, namely the *Semiotics*.(1) Bolzano's account of explication is reconstructed to show his contribution to the contemporary discussion." (p. 21)
(...)
"In the second section of the semiotics dealing with the use of signs in treatises and manuals, Bolzano introduces the notion of *Verständigung*.
In German, a *Verständigung* means to inform someone of something, to communicate with someone and to make oneself (or something) understood.(7)
Bolzano's English and French translators use the word *explication* for translating *Verständigung*, for this notion concerns the interpretative relation between linguistic and mental events: the relation between signs and intentions and the way in which we understand words. A *Verständigung* is more than the mere grasping or understanding of a word, however, for this word designates the linguistic act of making something explicit in such a way that it is understood by others and thus this concept plays an important role in communication." (p. 21-22)
(1) Bolzano, Bernard (1837), *Wissenschaftslehre (Theory of Science)*, Sulzbach, Seidel, [WL] IV, §§ 637-677; (1833-1841) *Von der mathematischen Lehrart (On the mathematical method)*, in Bernard Bolzano *Gesamtausgabe*, Stuttgart: Fromann-Holzboog, 1969-, Nachlass II, A, 7, [ML] § 9.
(7) The noun *Verständigung* is the nominalization of the verb *verständigen*, which means "to inform" ("den Leser zu verstandigen") or "to communicate."
The second use occurs especially with constructions using the genitive, e.g., "den Gastfreund der Ursache ihres Kummers zu verständigen" or "der jungen Fiirstin

meine Liebe zu verständigen." Sich verstandigen means "to make oneself understood" and, more specifically, "to correct mistakes or misunderstandings" (Missverständnisse). See H. Paul, *Deutsches Worterbuch* (Halle: Niemeyer, 1896, 1935), pp. 608-609, as well as contemporary dictionaries of the German language, such as the *Wahrig* (1966), Bertelsmann, (2002).

10. Kasabova, Anna. 2012. "Bolzano's Semantic Relation of Grounding: A Case Study." In *Inference, Consequence, and Meaning: Perspectives on Inferentialism*, edited by Gurova, Lilia, 85-103. Newcastle upon Tyne: Cambridge Scholars Publishing
Abstract: "I reconstruct Bolzano's account of the grounding relation (*Abfolge*) which, I argue, is a precursor of inferentialism as a basis for semantics and I apply the grounding relation to a particular case: episodic memory. I argue that the basis of episodic memory is not the empirical relation of causality but the semantic relation of grounding which explains why we remember some things rather than others."

11. Kasabova, Anita. 2013. "Dubislav and Bolzano." In *The Berlin Group and the Philosophy of Logical Empiricism*, edited by Milkov, Nikolay and Peckhaus, Volker, 205-228. Dordrecht: Springer
"Brief Introduction
Walter Dubislav (1895–1937) was an active member of the Berlin Group of logical empiricismin the early 1930s. A philosopher, mathematician and logician, he shared the thematic focus of the Berlin Group on the natural sciences, mathematics and logic. He shared the methodological demand of the Berlin Group that philosophical method of inquiry should follow the rigor and precision of formal sciences in exposition and logical reasoning (Rescher 2006, 283). A rigorous methodology for philosophy was also required by Bernard Bolzano (1781–1848), the Prague mathematician, logician and philosopher. Was it Bolzano's efforts to separate logic from psychology in the *Theory of Science* (Bolzano 1837) or his reconstruction of mathematics in the *Contributions to a Better Founded Exposition of Mathematics* (1810) which attracted Walter Dubislav's attention?
Dubislav was not interested in Bolzano's early attempts to develop a mathematical method for expounding objective dependence relations which hold between judgments as grounds and consequences (Bolzano 1810, II, § 2). His research is focused on the later Bolzano (1837). In a series of papers published between 1929 and 1931, he deals with Bolzano's Kant-criticism and Bolzano's contribution to modern logic. More specifically, he examines what he calls Bolzano's propositional functions (*Aussage- oder Satzfunktion*), his notion of analyticity and analytic statements, as well as his notions of probability (*Wahrscheinlichkeit*) and derivability (*Ableitbarkeit*)." (p. 205)

12. ———. 2013. "Bolzano on Kant's Definition of Analyticity – Does it Fall Short of Logical Precision?" *Philosophical Alternatives* no. 6:13-34
Abstract: "My commentary is Kant-friendly and I begin by re-situating the Siebel-Bolzano-Kant discussion on analytic judgments in regard to their history, namely, to Aristotle's predication. I focus on Siebel-Bolzano's objections that Kant's analytic judgments (i) have a definiens permitting too broad an interpretation, and (ii) that the definiens is too narrow. I re-examine Kant's use of 'covertly' and 'identity of concepts' and argue pace Mark Siebel that Kant's analytic judgments make explicit the shared content of subject and predicate. I then re-examine Kant and Bolzano's notion of (essential) distinctive feature (*Merkmal*) discussed by Siebel in the context of the 'contained in'/'contained under' issue, and show that Kant's analytic judgments are nominal definitions."

13. Kluge, Eike Henner. 1980. "Bolzano and Frege: Some Conceptual Parallels." *Grazer Philosophische Studien* no. 10:21-41
"Recent Frege scholarship has evidenced a growing interest in the historical basis of Frege's thought. By and large, that interest has focussed on the figure of Leibniz, and although there is still some disagreement over the precise nature and extent of the latter's influence, the fact that it exists is apparently beyond dispute. However,

there is another historical figure, of some importance in his own right, whose influence on Frege - or, to be more precise, the possibility of whose influence on Frege - has largely been ignored. I am referring to Bernard Bolzano (1781-1848). The purpose of this paper is to expose some interesting not to say profound similarities between certain fundamental doctrines of the two thinkers, and to suggest on that basis the likelihood of an influence of the former on the latter should be seriously considered." (p. 21)

14. Kneale, Wiiliam, and neale, Martha. 1962. *The Development of Logic*. Oxford Clrendon Press
Chapter V. *Logic after the Renaissance.* § 5. *Bolzano and Mill*, pp. 358-371.
"According to Bolzano a science in the objective sense of that word is a sum of objective truths. If it is set forth in a treatise, the truths of which it consists must, of course, be known to some man, but truths are not in general to be identified with truths known to men. On the contrary it is reasonable to suppose that the great majority of them are known only to God. For an objective truth is a true proposition-in-itself (*Satz-an-sich*), that is to say, a true propositional content, something thinkable or expressible but not necessarily thought or expressed.(6) Often the word 'judgement' is used in this sense, but it is not suitable as a technical term because it is sometimes used also for the act as opposed to the content of judging; and apart from that it would be misleading if applied to a content which was not believed but merely considered as an hypothesis. 'Judgement' is in fact just one of many words that we can use to refer to propositional contents in special contexts. Others are 'premiss' and 'conclusion', which logicians introduced as descriptions for sentences occurring in certain positions in arguments but used later as though they were designations for propositional contents." (p. 360)
(6) *Wissenschaftslehre* § 12.

15. Konzelmann, Ziv Anita. 2009. "Naturalized Rationality. A Glance at Bolzano's Philosophy of Mind." *Baltic International Yearbook ofCognition, Logic and Communication* no. 4:1-21
Abstract: "Bernard Bolzano's philosophy of mind is closely related to his metaphysical conceptions of substance, adherence and force. Questions as to how the mind is working are treated in terms of efficient (causal) faculties producing simple and complex representations, conclusive and non-conclusive judgments, and meta-representational attitudes such as believing and knowing. My paper outlines the proximity of Bolzano's account of "mental forces" to contemporary accounts of faculty psychology such as Modularity Theory and Simple Heuristics. While the modularist notions of domain specificity and encapsulated mental faculties align with Bolzano's allotment of domain specific tasks to correspondingly specified psychological forces (e.g. judging to "judgmental force", inferring to "inferential force" etc.), the emphasis of Simple Heuristics on accurate "fast and frugal" processes aligns with Bolzano's views regarding cognitive resources and the importance of epistemic economy. The paper attempts to show how Bolzano's metaphysics of mind supposes a conception of bound rationality that determines his epistemology. Combining the rationalist concern for epistemic agent responsibility in the pursuit of knowledge with a strong confidence in the reliability of causal processes to generate the right beliefs, his epistemology shows close affinities with contemporary Virtue Epistemology. According to Virtue Epistemology, knowledge requires that true beliefs be generated by reliable processes typical of a virtuous character. The thesis that Bolzano anticipates virtue epistemological considerations is corroborated by his discussion of heuristic principles that set the norms for the acquisition of knowledge. The paper explores possible relations between such principles and the presumed low-level heuristics of cognitive processes."

16. ———. 2011. "Bolzanian Knowing: Infallibility, Virtue and Foundational Truth." *Synthese* no. 183:27-45
Abstract: "The paper discusses Bernard Bolzano's epistemological approach to believing and knowing with regard to the epistemic requirements of an axiomatic

model of science. It relates Bolzano's notions of believing, knowing and evaluation to notions of infallibility, immediacy and foundational truth. If axiomatic systems require their foundational truths to be infallibly known, this knowledge involves both evaluation of the infallibility of the asserted truth and evaluation of its being foundational.

The twofold attempt to examine one's assertions and to do so by searching for the objective grounds of the truths asserted lies at the heart of Bolzano's notion of knowledge. However, the explanatory task of searching for grounds requires methods that cannot warrant infallibility. Hence, its constitutive role in a conception of knowledge seems to imply the fallibility of such knowledge. I argue that the explanatory task contained in Bolzanian knowing involves a high degree of epistemic virtues, and that it is only through some salient virtue that the credit of infallibility can distinguish Bolzanian knowing from a high degree of Bolzanian believing."

17. Koren, Ladislav. 2014. "Quantificational Accounts of Logical Consequence I: From Aristotle to Bolzano." *Organon F* no. 21:22-44

Abstract: "So-called quantificational accounts explicate logical consequence or validity as truth-preservation in all cases, cases being construed as admissible substitutional variants or as admissible interpretations with respect to non-logical terms. In the present study, which is the first from three successive studies devoted to quantification accounts, I focus on the beginning of systematic theorizing of consequence in Aristotle's work, which contains the rudiments of both modal and formal accounts of consequence.

I argue, *inter alia*, that there is no evidence for the claim that Aristotle propounded a quantificational account, and that for a full-fledged quantificational approach in a modern style we need to turn to Bolzano's substitutional approach, whose motivation, structure and problems are explained in the second part of this study."

"Bolzano might have been the first to elaborate rigorously on this very idea in his account of logical validity and deducibility. The following passage deserves a full quote:

Among the definitions of [the concept of deducibility] … one of the best is that of Aristotle: 'a syllogism is a discourse in which, certain things being stated, something other than what is stated follows of necessity from their being so.' Since there can be no doubt that Aristotle assumed that the relation of deducibility can hold between false propositions, the 'follows of necessity' can hardly be interpreted in any other way than this: that the conclusion becomes true whenever the premises are true. Now it is obvious that we cannot say of one and the same class of propositions that one of them becomes true whenever the others are true, unless we envisage some of their parts as variable.

For propositions none of whose parts change are not sometimes true and sometimes false; they are always one or the other. Hence when it was said of certain propositions that one of them becomes true as soon as the others do, the actual reference was not to these propositions themselves, but to a relation which holds between the infinitely many propositions which can be generated from them, if certain of their ideas are replaced by arbitrarily chosen other ideas. (Bolzano 1972, § 155, 219-220)" (p. 33)

References

Bolzano B. (1837/1972): *Theory of Science*. Translated and edited by R. George. Oxford: Basil Blackwell. Translation of selected parts of *Wissenschaftslehre. Versuch einer ausführlichen und grösstentheils neuen Darstellung der Logik mit steter Rücksicht auf deren bisherige Bearbeiter*. 4 Vols. Sulzbach: J. E. v. Seidel.

18. Krämer, Stephan. 2011. "Bolzano on the Intransparency of Content." *Grazer Philosophische Studien* no. 82:189-208

Summary: "Content, according to Bolzano, is intransparent: our knowledge of certain essential features of the contents of our contentful mental acts (such as their identity and composition) is often severely limited. In this paper, I identify various intransparency theses Bolzano is committed to, and present and evaluate the defence

he offers for his view. I argue that while his intransparency theses may be correct, his defence is unsuccessful. Moreover, I argue that improving on his defence would require substantial modifications to his general epistemology of content."

19. Krause, Andrej. 2006. "Are Bolzano's Substances Simple?" *American Catholic Philosophical Quarterly* no. 80:543-562
Abstract: "This article analyzes one aspect of Bolzano's metaphysics. It discusses the question of whether, according to Bolzano, substances are simple or not. In the opinion of some commentators, he accepts composed substances, that is, substances having substances as proper parts. However, it is easily possible to misinterpret his position. This paper first tries to reconstruct Bolzano's definitions of the concept of substance and suggests that he should be able to agree with the following final definition: x is a substance if and only if x is real and not a property. After this, it is shown that, according to Bolzano, every substance is simple in a fourfold sense: No substance has (1) adherences as parts, (2) substances as proper parts, (3) spatially extended parts, and (4) temporal parts."

20. Kriener, Jönne. 2017. "Bolzano." In *The History of Philosophical and Formal Logic: From Aristotle to Tarski*, edited by Malpass, Alex and Antonutti Marfori, Marianna, 121-142. New York: Bloomsbury Academic
"This chapter presents core elements of the logic developed by the Austrian mathematician and philosopher Bernard Bolzano during the fi rst decades of the nineteenth century. * For Bolzano, logic deals with scientific reasoning quite generally. A science for him is an ordered body of true propositions. Accordingly, I will begin by explaining Bolzano's notion of proposition.
When we engage in science, our reasoning crucially involves the derivation of some propositions from others. Bolzano's most advanced innovation in logic is his theory of deducibility (*Ableitbarkeit*). Famously, it anticipates some aspects of the modern concept of logical consequence.
Finally we deal with a more demanding, and less well understood, way in which Bolzano took scientific truths to be ordered: his notion of grounding (*Abfolge*). Grounding is central to Bolzano's thinking about science, and thus an important part of Bolzano's logic." (p. 121)

21. Künne, Wolfgang. 1997. "Propositions in Bolzano and Frege." *Grazer Philosophische Studien* no. 53:203-240
Reprinted in W. Künne, *Versuche über Bolzano / Essays on Bolzano*, pp. 157-195 and in Michael Beaney and Erich H. Reck (eds.), *Gottlob Frege. Critical Assessments of Leading Philosophers. Vol. I: Frege's Philosophy in Context*, New York: Routledge, 2005, pp. 124-153.
Abstract: "In the Preface to his book *Frege and Other Philosophers* [New York: Oxford University Press, 1996] Michael Dummett says: "The only nineteenth-century philosopher of whom it would be reasonable to guess, just from the content of his writings and those of Frege, that he had influenced Frege, is Bernhard Bolzano, who died in the year Frege was born; but there is no evidence whatever that Frege ever read Bolzano".(1) Apart from one grave mistake this seems to me to be exactly right. Did you notice the "grave" mistake? Bolzano's first name is spelled with an "h" and thereby deprived of its Italian flavour.(2)
To be sure, there were two mathematically minded philosophers and one philosophically minded mathematician who emphatically appealed to Bolzano in the course of their discussions with Frege. So he was made aware of the fact that Bolzano's work was potentially relevant for his own concerns. But Husserl, Kerry and Korselt were critical of Frege, and Frege in turn was very critical of them. Perhaps that's why he never bothered to read an author they praised, — who knows... (3)
There are many respects in which a comparison between Bolzano and Frege could be philosophically fruitful. But what is most striking for everyone who reads both Frege's *Logische Untersuchungen* and Bolzano's *Wissenschaftslehre* is the close similarity between what Frege calls *Gedanken* and what Bolzano calls *Sätze an sich*.

In the literature this resemblance is frequently mentioned, but I have never seen a detailed investigation into this topic.(4) In this paper I shall recall some of the well-known respects, and point out some less well-known respects, in which F(rege)-Propositions and B(olzano)-Propositions (as I shall call them) resemble each other. But I am at least as keen to underline some philosophically important differences beneath those similarities."

(1) Dummett, vii. The same claim is to be found in Dummett *Ursprünge der analytischen Philosophie*, Frankfurt /M., 1988, 34; *Origins of Analytical Philosophy*, Cambridge/MA, 1993, 24, and *Frege. Philosophy of Mathematics*, London, 1991, 47. I cannot take seriously E.-H. Kluge's contention that there was "a de facto, perhaps even unconscious influence that manifested itself in a similarity of conceptual approach and a parallelism of positions defended" (Kluge "Bolzano and Frege: Some Conceptual Parallels, in: *Grazer Philosophische Studien* 10 (1980), pp. 21-42, 21 ff.). Several extremely careless translations from the *Wissenschaftslehre* in Kluge's article seem to be symptomatic of a rather superficial acquaintance with Bolzano's work. I also disagree with much of his interpretation of Frege.
(2) Bemard(o)'s father was born at the Lago di Como. By the way, the misspelling is endemic. In Vienna it marred even the attempt to name a street after Bolzano.
(3) Cp. Künne "Die Ernte wird erscheinen...' Die Geschichte der Bolzano-Rezeption (1849-1939)", pp. 9-82, esp. 31-50; revised version in this volume: 326-359.
(4) Of course, in Dummett *Ursprünge.../Origins...* ch. 4, it is also duly registered, but the focus is rather on Frege.

22.　　　―――. 1998. "Bolzano, Bernard." In *Routledge Encyclopedia of Philosophy*, edited by Craig, Edward, 824-828. New York: Routledge
Abstract: "Bernard Bolzano was a lone forerunner both of analytical philosophy and phenomenology. Born in Prague in the year when Kant's first *Critique* appeared, he became one of the most acute critics both of Kant and of German Idealism. He died in Prague in the same year in which Frege was born; Frege is philosophically closer to him than any other thinker of the nineteenth or twentieth century. Bolzano was the only outstanding proponent of utilitarianism among German-speaking philosophers, and was a creative mathematician whose name is duly remembered in the annals of this discipline. His *Wissenschaftslehre* (Theory of Science) of 1837 makes him the greatest logician in the period between Leibniz and Frege. The book was sadly neglected by Bolzano's contemporaries, but rediscovered by Brentano's pupils: Its ontology of propositions and ideas provided Husserl with much of his ammunition in his fight against psychologism and in support of phenomenology, and through Twardowski it also had an impact on the development of logical semantics in the Lwów-Warsaw School."

23.　　　―――. 2001. "Constituents of Concepts: Bolzano vs. Frege." In *Building on Frege. New Essays on Sense, Content, and Concept*, edited by Newen, Albert, Nortmann, Ulrich and Stuhlmann-Laeisz, Rainer, 267-285. Stanford: CLSI Publications
Reprinted in: W. Künne, *Versuche über Bolzano / Essays on Bolzano*, Sankt Augustin: Academia Verlag 2008, pp. 211-232.
"In section 1 of this paper I shall point out that in one respect the grandfather of analytical philosophy was more conservative than its great-grandfather: Frege at least partially endorsed the Canon of Reciprocity which was a prominent ingredient of the post-Cartesian logical tradition, Bolzano rejected it completely. In section 2 I shall try to defend one part of this bipartite principle. In section 3 I shall try to show that this line of defence is open to Frege. This claim is based on a reconsideration of Frege's notion of the marks (*Merkmale*) of a concept, — a notion which is generally treated rather cavalierly in the literature on Frege. In section 4 I shall present a problem that Bolzano and Frege share because they both think of complex senses in part-whole terms. Finally, in part 5, I shall briefly celebrate what I deem to be Bolzano's victorious attack on the other part of the Canon of Reciprocity (CR)." (p. 211)
(...)
Here is Kant's formulation of CR: (4)

(CR) Content and extension of a concept stand in an inverse relation. The more objects fall under a concept, the fewer conceptual components are contained within the concept, and vice versa.

Bolzano attacks CR in § 120 of his monumental *Wissenschaftslehre* (1837; henceforth '*WL*' for short). (5)

(4) 'Inhalt und Umfang eines Begriffs stehen gegen cinander in umgekehrtem Verhältnisse. Je mehr namlich ein Begriffunter sich enthalt, desto weniger enthalt er in sich und umgekehrt' (Kant (10), 148). Bolzano's contention in WL I 294, 570, repeated by many authors, that (CR) is to be found already in the Logic of Port Royal (Arnauld/Nicole) is not tenable (Schmauks 14f.). An early (if not the earliest) formulation of (CR) is given in Wolff (l), 138.

(5) Bolzano quotes (CR) in WL I 292.

[Another definition of CR: "Every concept, as partial concept, is contained in the representation of things; *as ground of cognition, i.e., as mark*, these things are contained under it. In the former respect every concept has a content, in the other an extension.

The content and extension of a concept stand in inverse relation to one another. The more a concept contains under itself, namely, the less it contains in itself, and conversely.

Note. The universality or universal validity of a concept does not rest on the fact that the concept is a partial concept, but rather on the fact that it is a ground of cognition." (I. Kant, *The Jäsche Logic*, § 7, *Content and extension of concepts*, in: *Lecture on Logic*, Cambridge: Cambridge University Press, 1992, p. 96]

24.   ———. 2003. "Bernard Bolzano's *Wissenschaftslehre* and Polish Analytical Philosophy Between 1894 and 1935." In *Philosophy and Logic in Search of the Polish Tradition: Essays in Honour of Jan Wolenski on the Occasion of His 60th Birthday*, edited by Kijania-Placek, Katarzyna, 179-192. Dordrecht: Kluwer

"In this paper I want to examine some of the many Polish contributions to a critical discussion of Bolzano 's masterpiece.

Twardowski praised Bolzano for clearly distinguishing, under the headings [1] *subjektive Vorstellung*, [2] *Vorstellung an sich or objektive Vorstellung*, and [3] *Gegenstand*, what ought to be distinguished, namely [1] the mental act of representing an object, [2] the content of this act, and [3] its object. Twardowski's book [Twardowski 1892] voiced a fundamental disagreement with Bolzano, which, some would say, was to become rather fruitful, and it is marred by a fundamental misunderstanding.

The disagreement concerns the question whether all representings are objectual (*gegenständlich*) or whether some representings lack an object. For Bolzano this was a matter of course: The act of representing I give voice to when uttering the definite description 'the present King of Poland' has no object.

Twardowski disagreed: my representation does have an object, but it is a non-existent one,(4) This move paved the way for Meinong (as weIl as for Routley and Parsons)(5). Meinong's *Theory of Objects* is based upon the 'principle of the independence of being from being-so (*Prinzip der Unabhängigkeit des Soseins vom Sein*)' : an object can be thus-and-so even if it has no being (i.e, even if it neither 'exists' nor 'subsists'). Bolzano was strongly opposed to this: 'as the old canon has it (*wie schon der alte Kanon besagt*) - *nonentis nullae sunt offectiones*.(6) In 1894 another pupil of Brentano's, Edmund Husserl, who had already come across Bolzano as a mathematician, forcefully defended the claim that some representings have no object whatsoever against Twardowski's criticism.(7) (In some respects this controversy foreshadows that between Meinong and post-'On Denoting-Russell.)" (p. 179-180)

(4) Twardowski (1982), p. 24.

(5) Meinong 'Über Gegenstandstheorie'. On Meinong's reading of Bolzano cp. Künne (1997), §11.

(6) Bolzano, *Athanasia*; pp. 292 f. As to the Canon cp. Descartes, *Principia* I § 52.

(7) Husserl (1894), p. 303.

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Husserl, Edmund: 1894, 'Immanenter und wirklicher Gegenstand', Husserliana XXII, Nijhoff, TheHague,1979, pp. 303-338.

Künne, Wolfgang: 1997, ' "Die Ernte wird erscheinen", Die Geschichte der Bolzano-Rezeption', in: H. Ganthaler and O. Neumaier (eds.), *Bolzano und die österreichische Geistesgeschichte*, Academia, Sankt Augustin, pp. 9-82.

Meinong, Alexius: 1904, 'Über Gegenstandstheorie' , reprinted in *Gesamtausgabe*, Vol. VII, Graz 1968, pp. 483-535.

Twardowski, Kazimierz: 1982, *Zur Lehre vom Inhalt und Gegenstand der Vorstellungen*, 1894, Philosophia, München.

25.   ———. 2003. "Are Questions Propositions?" *Revue Internationale de Philosophie* no. 57:157-168

Reprinted in: W. Künne, *Versuche über Bolzano / Essays on Bolzano*, Sankt Augustin, Academia Verlag, 2008, pp. 197-210.

"In the Prolegomena to his *Logische Untersuchungen* (LU) Edmund Husserl praised the first two volumes of Bernard Bolzano's *Wissenschaftslehre* (WL) as 'far surpassing everything else world literature has to offer as systematic exposition of logic'. Eleven years later the key is a bit lower: These volumes, he now says, occupy 'the highest rank in the logical world literature of the 19th century'.(2)

To the best of my knowledge, the most extensive and most thorough discussion of a single contention in Bolzano's philosophy of logic that can be found in any of Husserl's books and articles published during his lifetime is contained in the last chapter of his LU.(3) The topic of this discussion is a courageous if not outrageous Bolzanian contention which, at least on the face of it, flatly contradicts what most philosophers since Aristotle took for granted. *Questions*, Bolzano claims, *are a special kind of propositions and hence truth-evaluable*. Let me call this Bolzano's *Tenet*.

In my little exercise I shall reconstruct and evaluate both Bolzano's *Tenet* and Husserl's criticism thereof. I shall argue that the latter is largely correct, but that in the end Husserl and Bolzano are both wrong. Somebody else got it right: a philosopher and mathematician for whom one would also claim a very high rank indeed in the logical world literature of the 19th, and of any, century. But this is to anticipate.

What exactly is it that Bolzano maintains when he says that questions are a kind of propositions? By 'proposition (Satz an sich)' he means something that is neither mental nor linguistic. Propositions are thinkables and sayables which can be singled out by that-clauses. Such thinkables and sayables are truth-evaluable, hence, assuming bivalence as Bolzano does, they are either true or false. If Bolzano's Tenet is to make any sense at all, by 'questions' he cannot mean anything mental or linguistic. Now the term 'question' is multiply ambiguous, and for our inquiry it is most important not to get entangled in this ambiguity. We must distinguish

Questions 1: mental acts of asking oneself a question,

Questions 2: illocutionary acts of asking a question,

Questions 3: interrogative sentences, and

Questions 4: askables.

Wonderings, i. e. sense-1-questions, are voiced by sense-2-questions. Husserl occasionally labels the former '*innerliche Fragen*' and the latter '*Anfragen*'. The second term (which in ordinary German has a far narrower application) is meant to register the fact that sense-2-questions are essentially addressed to someone. Sense-3-questions are linguistic vehicles of sense-2-questions; unsurprisingly Husserl calls them '*Fragesatze*'. Sense-4-questions, finally, are possible contents of sense-1- and of sense-2-questions, and sometimes they coincide with the conventional linguistic meaning of sense-3-questions. (They do so only if the latter are free of context-

sensitive elements.) In Husserl's language, an askable is a '*Frageinhalt*', and he identifies it with the '*Bedeutung*' (meaning) des *Fragesatzes'*. (4) Askables are those thinkables and sayables which can be singled out by indirect sense-3-questions (for example, by the clauses in 'He asked whether the conference had started' or 'She asks when the conference will end'). So let us reformulate Bolzano's Tenet: *Askables are a proper sub-set of propositions*." (pp. 197-198).

(...)

"At the point we have now reached we can recognize that the following stance has a chance of being coherent: conceding that English yes/no interrogatives are not true or false (sc. in English) any more than any other interrogatives are, while maintaining that yes/no interrogatives, in contradistinction to search interrogatives, express propositions which are true or false (*simpliciter*). This is coherent if we take yes/no interrogatives to be an exception to the right-to-left half of a bridge-principle that is unexceptionable as regards *declarative* sentences: Sentence S is true in language L at context c if and only if what is expressed by S in L at c is true. This move would mitigate the tension between Aristotle's and Bolzano's views about questions, which Husserl emphasized at the outset of his discussion of Bolzano's Tenet." (pp. 209-210).

(2) Husserl (3), I 225; letter to Friedjung, in Husserl (14), VII 97.

(3) In 1920 Husserl emphasized that he had refrained from modifying the text of the 1st edition only because in the meantime his views had changed too drastically (preface to the 2nd edition of Husserl(3), II/2 vii). I shall concentrate exclusively on his 1901 position, more precisely: on those aspects of that position which are relevant for an evaluation of Bolzano's thesis about questions. (Page references are always to the 2nd edition.)

(4) Husserl (3), II/2 211-212.

26.   ———. 2006. "Analyticity and Logical Truth: from Bolzano to Quine." In *The Austrian Contribution to Analytic Philosophy*, edited by Textor, Mark, 184-249. New York: Routledge

Reprinted in: W. Künne, *Versuche über Bolzano / Essays on Bolzano*, Sankt Augustin: Academia Verlag 2008, pp. 233-303.

"Truth-value bearers and the concept of truth

For Bolzano analyticity, like truth and falsity, is a property of propositions (*Sätze an sich*). He takes the concept of a proposition to resist analysis or conceptual decomposition (*Erklärung*), but there are other ways of 'achieving an understanding (*Verständigung*)' of a concept.(3)

Consider a report of the following type: 'Johanna said that copper conducts electricity, Jeanne said the same thing, though in different words, and Joan believes what they said.' Here a that-clause is used to single out something that is [1] said by different speakers, [2] distinct from the linguistic vehicles used for saying it, and [3] believed by somebody. 'Now, this is the sort of thing I mean by *proposition*,' Bolzano would say, 'propositions are sayables and thinkables, possible contents of sayings and thinkings, that can be singled out by that-clauses.'(4)"

(3) 3 Cf. Bolzano, *Wissenschaftslehre* (henceforth: WL, quoted by volume and page number) IV 243–5, 488–90, 542–5, 547. The manuscript of *WL* was published only seven years after Bolzano had begun to search for a publisher (outside the borders of the Austrian Empire). The book was as unsuccessful as can be. It was only several decades after Bolzano's death that some philosophers in Vienna, Halle and Lemberg recognized some of the gold mines it contains. See Künne (2) and (5).

(4) Bolzano's views on propositions are examined, and compared with Frege's, in Künne (3).

References

Künne, W.:

(2) ' "*Die Ernte wird erscheinen*", *Die Geschichte der Bolzano-Rezeption*' [I], in H. Ganthaler and O. Neumaier (eds) *Bolzano und die österreichische Geistesgeschicht*e, St Augustin: Academia Verlag, 1997: 9–82.

(3) 'Propositions in Bolzano and Frege', in (4): 203–40.

(4) with M. Siebel and M. Textor (eds) *Bolzano and Analytic Philosophy*, Grazer Philosophische Studien 53, 1997.

(5) '*Die Geschichte der philosophischen Bolzano-Rezeption*' [II], in H. Rumpler (ed.) *Bernard Bolzano und die Politik*, Wien: Böhlau, 2000: 311–52.

27.　　　———. 2007. "Some Varieties of Deception." In *Explaining the Mental. Naturalist and Non-Naturalist Approaches to Mental Acts and Processes*, edited by Penco, Carlo, Beaney, Michael and Vignolo, Massimiliano, 106-122. Cambridge: Cambridge Scholars Publishing

"Members of the family of concepts to which the title of this paper alludes play important roles in various areas of theoretical and practical philosophy. I want to throw some light on these concepts and their interrelations, and in doing so I also want to make Bernard Bolzano's analytical work in this area better available. The great-grandfather of analytical philosophy, a contemporary of Hegel's, was a great mathematician, and he held the chair of Philosophy of Religion at Prague University until the Emperor sacked him. It was part of his job to deliver a sermon, a so-called *Erbauungsrede* or exhortation. on each and every Sunday and on church holidays. These sermons contain most of the material I shall exploit in this paper.(1) None of my definitions literally coincides with Bolzano's, but most of them are substantially due to him.

Bolzano never put his accounts of various kinds of *deceiving* and of various kinds of *trying to deceive* together. but if one attempts to arrange them systematically it runs out that for the most part they harmonize very well with each other. Whenever they don't I shall take the liberty of making adjustments that are meant lo enhance their plausibility." (p. 106)

(1) The pertinent sermons will be quoted as 'I', 'II', 'III ' and 'IV', followed by page number. I. deception & cheating, 13. 04.1817, in Bolzano. *ER4*, pp 306-313: II. self-deception, 15. 07.1810. in Bolzano. *ER4*, pp. 36-45: lll. Hypocrisy 16.02.1812. in Bolzano. *ER2*,. pp. 289-300. IV *Lying* 18. 03.1810, in Bolzano, *ER2*, pp. 73-81. Abbreviated references to Bolzano's works are spell out in the bibliography to this paper Quotations from Bolzano are always in italics.

28.　　　———. 2008. *Versuche über Bolzano / Essays on Bolzano*. Sank Augustin: Academia Verlag

Essays in English: Propositions in Bolzano and Frege 157; Are Questions Propositions? 197; Constituents of Concepts 211; Analyticity and Logical Truth: From Bolzano to Quine 233-304

29.　　　———. 2009. "Bolzano and (Early) Husserl on Intentionality." In *Acts of Knowledge: History, Philosophy and Logic, Essays Dedicated to Göran Sundholm*, edited by Primiero, Giuseppe and Rahman, Shahid, 95-140. London: College Publications.

30.　　　———. 2011. "On Liars, 'Liars' and Harmless Self-Reference." In *Mind, Values, and Metaphysics. Philosophical Essays in Honor of Kevin Mulligan. Volume 2*, edited by Reboul, Anne, 355-429. Dordrecht: Springer

Abstract: "The topics of this chapter are (1) the history of a mislabelled antinomy and of a pseudo-paradox and (2) some logico-semantical peculiarities of self-referential sentences that do not give rise to a paradox. My points of departure will be Bernard Bolzano's discussions of a plain fallacy he called The Liar and of an antinomy that we unfortunately got used to calling The Liar. He found a pointer to the fallacy in Aristotle's *Sophistical Refutations*. In a logic manual of the early renaissance, he came across a source of the antinomy in the form of a sentence that declares itself to be false. In Sect. 24.1, I shall praise Bolzano's reaction to the fallacy and discuss his analysis of the concept of lying. I will present some ancient expositions of the antinomy and go on to criticize, along Moorean lines, Russell's rather sloppy account. Finally, I will defend the author of the 'Letter to Titus' against the charge of being paradox-blind when he invoked a Cretan denigrator of all Cretans. (Some twentieth century logicians and analytic philosophers are the villains of this part of my chapter: I shall criticize their carelessness with respect to a

well-entrenched concept, and I shall complain that they keep on alluding to ancient texts without bothering to read them closely.) In Sect. 24.2, I shall reconstruct Girolamo Savonarola's excellent exposition of the antinomy [*], examine Bolzano's criticism of the Florentine diagnosis and reject his own attempt to defuse the paradox. (I shall not try to improve on his attempt.) In this context, Bolzano makes a point concerning self-referential sentences that is not affected by the failure of his alleged dissolution of the antinomy. He rightly takes it to be a matter of course that there are ever so many harmlessly self-referential sentences. But he shows that some care is needed when one wants to formulate their negation. In Sect. 24.3, I will expound this point.

It turns out that similar problems arise when one uses harmlessly self-referential sentences in deductive arguments. Such sentences also enforce a revision of certain intuitively plausible constraints on translation."

[*] Girolamo Savonarola's Compendium logicae (Bolzano, WL I 78–80; Savonarola, CL 151, lines 6–24).

References

Savonarola G. (1492) *Compendium logicae*. In: Savonarola G. (1982) Opere, vol 22, *Scritti filosofici*, 1 (Garfagnini G. Garin E. (eds)). Roma 3–208.

31. ———. 2015. "On Having a Property: Corrigenda in Bolzano's *Wissenschaftslehre*." *Grazer Philosophische Studien* no. 91:365-408.

32. ———. 2018. "Truth, Ascriptions of Truth, and Grounds of Truth Ascriptions: Reflections on Bolzano and Frege." In *Eva Picardi on Language, Analysis and History*, edited by Coliva, Annalisa, Leonardi, Paolo and Moruzzi, Sebastiano, 31-66. Cham (Switzerland): Palgrave Macmillan

"In Sect. 1 of this chapter, I shall discuss Bolzano's attempt to give a definition of the concept of truth, in Sect. 2 I shall ask whether Frege succeeds in showing that all such endeavours are doomed to failure. In this chapter I shall remain neutral as to the question of definability, but the key premise of his alleged proof of indefinability. The equivalence schema 'The thought that things are thus and so is true if, and only if, things are that way' captures an important feature of the concept of truth.

Frege went beyond this *true-iff* principle when he claimed that the two halves of such biconditionals do not only stand and fall together,—they even express one and the same thought. It is doubtful whether Frege has any good argument for this Identity Thesis. In Sect. 3 of this chapter I will give reasons for this doubt. In Sect. 4 I shall show that, and why, Bolzano rejects the Identity Thesis. Bolzano emphasizes an important feature of our concept of truth that is not captured by the equivalence schema. One can hint at this additional feature by saying, 'If the thought that things are thus and so is true, then it is true because of things' being that way, and not vice versa'. In Sect. 5 I shall locate this true because-of principle in the theory of grounding (*Abfolge*) that Bolzano outlined in the second volume of his monumental *Wissenschaftslehre* (henceforth: *WL*). In Sect. 6 I shall explore whether the Identity Thesis can be refuted by appealing to (the Bolzanian reformulation of) the true-because-of principle. On the following pages, I shall not try to argue for the true-because-of principle. Like Aristotle and Bolzano I shall accept it as a basic intuition concerning truth.(1) The brief Appendix points to a use of the notion of grounding that has been neglected in recent literature although Bolzano deemed it to be of great importance." (pp. 31-32)

(1) Any attempt at a proof of this principle from a definition of truth presupposes, of course, that pace Frege such a definition is to be had.

33. Lange, Marc. 2022. "Bolzano, the Parallelogram of Forces, and Scientific Explanation." In *Bolzano's Philosophy of Grounding: Translations and Studies*, edited by Roski, Stefan and Schnieder, Benjamin, 394-417. New York: Oxford University Press

"Marc Lange turns to Bolzano's philosophy of physics and discusses his explanatory proof of the parallelogram law for the composition of forces. Lange argues that this

proof is neither clearly causal nor clearly non-causal. In order to illuminate its explanatory potential, Lange compares it with Bolzano's explanation of the intermediate value theorem: Bolzano takes the latter to have a unified explanation covering all functions, and in a similar spirit he regards an explanation of the parallelogram law as unifying it with analogous laws regarding various other quantities that are potential causes." (p. 38)

34.   Lapointe, Sandra. 2002. "Bolzano's Hidden Theory of Universal Quantification." In *The Logica Yearbook 2001*, edited by Childer, Timothy and Ondrej, Majer, 37-48. Prague: Filosofia. Publishing House of Prague Institut of Philosophy.

35.   ———. 2004. "Why Frege Never Read Bolzano." In *The Logica Yearbook 2003*, edited by Behounek, Libor, 183-194. Prague: Filosofia. Publishing House of Prague Institute of Philosophy.

36.   ———. 2006. "Bolzano on Grounding or Why Is Logic Synthetic." In *The Logica Yearbook 2005*, 113-126. Prague: Filosofia.

37.   ———. 2007. "Bolzano Semantics and His Critique of the Decompositional Conception of Analysis." In *The Analytic Turn*, edited by Beaney, Michael, 219-234. London: Routledge
"When asked to explain what conceptual analysis is, philosophers often resort to the idea of decomposition: to analyse an expression or a concept is to break it down into its (simpler) components. Although the notion of decomposition is a convenient figure of speech, without qualifications it can hardly be said to provide an informative description of what is involved in conceptual analysis. It could be argued, however, that this was not always the case. In Kant's theory, for instance, the conception of analysis is literally decompositional: notions such as *Zergliederung, Auflösung', `Inhalt'* and *enthalten sein'* are meant to provide a relatively straightforward description of the mereological conception of the formal features of and relations between concepts he had inherited from his predecessors, contrary to what influential interpretations such as Quine (1953: 21) suggest.(2) In what follows, I'll use the expression `decompositional conception of analysis' to refer to the conception of analysis that underlies Kantian semantics and, most notoriously, the Kantian definition of analyticity. My concern, though, is not primarily with Kant nor with analyticity but with Bernard Bolzano's conception of analysis. A superficial reading of Bolzano's *Theory of Science - Wissenschaftslehre* (Bolzano 1837; hereafter *WL)* - could lead one to think that Bolzano also subscribed to the decompositional conception of analysis. Yet, while Bolzano sanctions Kant's account in his earlier work (cf. Bolzano 1810: §5; 1812: §30) he came explicitly to reject it. Contrary to what is often assumed, Bolzano's understanding of what it means for a concept to be 'included' in another concept or for a given concept to have a particular content is radically different from Kant's and from that of Bolzano's other immediate predecessors. In fact, Bolzano anticipated some of the most important developments of twentieth-century semantics.(3)
I begin the paper with a brief sketch of the decompositional conception of analysis in section 1, and then in section 2 I present Bolzano's criticism of this conception. In section 3, I explain the main lines of Bolzano's reductive programme of analysis. Section 3, I hope, will go some way towards establishing the continued interest of Bolzano's semantic analyses. One of the main consequences of Bolzano's rejection of the decompositional conception of analysis is the need to find a new way to define semantic notions such as analyticity or validity. For that purpose, Bolzano developed a new and ingenious substitutional method. I sketch this method in section 4. I conclude by pointing out some important aspects of Bolzano's historical impact." (pp. 219-220)
(2) I deal in more length with this question in Lapointe *Qu'est-ce que l'analyse?*, Paris, Vrin, 2008.
(3) Superficial knowledge of medieval semantics suffices to convince that similarities are not scarce but this, unfortunately, remains to be studied.

38.   ———. 2010. "Bolzano *a priori* Knowledge, and the Classical Model of Science." *Synthese* no. 174:263-281

Abstract: "This paper is aimed at understanding one central aspect of Bolzano's views on deductive knowledge: what it means for a proposition and for a term to be known a priori. I argue that, for Bolzano, a priori knowledge is knowledge by virtue of meaning and that Bolzano has substantial views about meaning and what it is to know the latter. In particular, Bolzano believes that meaning is determined by implicit definition, i.e. the fundamental propositions in a deductive system. I go into some detail in presenting and discussing Bolzano's views on grounding, a priori knowledge and implicit definition. I explain why other aspects of Bolzano's theory and, in particular, his peculiar understanding of analyticity and the related notion of Ableitbarkeit might, as it has invariably in the past, mislead one to believe that Bolzano lacks a significant account of a priori knowledge. Throughout the paper, I point out to the ways in which, in this respect, Bolzano's antagonistic relationship to Kant directly shaped his own views."

39.   ———. 2011. *Bolzano's Theoretical Philosophy. An Introduction*. New York: Palgrave Macmillan

Contents: Michael Beaney: Foreword VIII; Acknowledgements XI; Introduction 1; 1. Kant and German Philosophy 11; 2. Decomposition 18; 3. Meaning and Analysis 29; 4. A Substitutional Theory 43; 5. Analyticity 59; 6. *Ableitbarkeit* and *Abfolge* 72; 7. Justification and Proof 91; 8. *A priori* Knowledge 102; 9. Things, Collections and Numbers 116; 10. Frege, Meaning and Communication 128; 11. Husserl, Logical Psychologism and the Theory of Knowledge 139; Notes 158; Bibliography 170; Index 180-183.

"Bernard Bolzano (1781-1848) occupies a unique place in the history of modern philosophy. Born in the year in which Kant's *Critique of Pure Reason* was published and dying in the year in which Frege was born, his philosophy - like his life - can be seen as offering a bridge between Kant's seminal work and the birth of analytic philosophy. In Bolzano's writings, one finds many of the characteristic themes of analytic philosophy anticipated. Like Frege and Russell after him, Bolzano was dissatisfied with Kant's account of mathematics and realised that a better conception of logic was required to do justice to mathematics. Bolzano's conception of logic was not Frege's or Russell's, but he did criticise traditional subject-predicate analysis, suggested that there was a fundamental form underlying all types of proposition and was insistent on the need to keep psychology out of logic. Like Frege, Bolzano construed existential statements as being concerned with the non-emptiness of appropriate 'ideas' *('Vorstellungen an sich'* in Bolzano's terms) or 'concepts' *(Begrime'* in Frege's terms), and his conception of 'propositions' *(Satze an sich')* is similar in many respects to Frege's conception of 'thoughts' *('Gedanken')*. Like Frege, too, Bolzano emphasised that there is a class of entities, including both 'ideas'/'concepts' and 'propositions'/'thoughts', which are objective but not actual *('wirklich')*, in the sense of not existing in the spatio-temporal realm.

Despite these similarities, however, Bolzano had no direct influence on any of the acknowledged founders of analytic philosophy. He had an influence on other German-speaking philosophers such as Franz Brentano, Benno Kerry, Edmund Husserl, Alwin Korselt and Kazimierz Twardowski, who themselves had an influence on the early analytic philosophers, both through correspondence and in their own publications (even if, often, mainly as a target of criticism). Through Twardowski, the founder of the Lvov-Warsaw school, he also had an influence on a whole generation of Polish logicians and philosophers, including Jan Lukasiewicz, Stanislaw Lesniewski and Alfred Tarski, who played an important role in the development of analytic philosophy. So a full account of the history of analytic philosophy must certainly pay attention to Bolzano's work. His significance, however, lies not just in these patterns of influence. The similarities and differences between his views and those of Frege, in particular, reveal much about the nature of analytic philosophy: the conceptions of analysis and logical form involved, for example, and key debates such as those about analyticity and other modal notions.

These influences and connections are explored and elucidated by Sandra Lapointe in this book.
At the heart of Bolzano's logic - logic being understood in the traditional broad sense as including both methodology and theory of science (hence the title of Bolzano's major work, the *Wissenschaftslehre)* - lies his critique of Kant. As Lapointe explains in the first three chapters, Bolzano criticises Kant's theory of intuition and his decompositional conception of analysis. In doing so, Bolzano develops his own positive doctrines, concerning analyticity and logical consequence, in particular, based on a method of substitution, as Lapointe elaborates in Chapters 4-6. In the remaining chapters, further clarifying his semantic theory, she discusses his epistemological and ontological views and his connection with Frege and Husserl." (from the Foreword by Micharl Beaney).

40.   ———. 2012. "Is Logic Formal? Bolzano, Kant and the Kantian Logicians." *Grazer Philosophische Studien* no. 85:11-32
Abstract: "In the wake of Kant, logicians seemed to have adhered to the idea that what is distinctive of logic is its "formality". In the paper, I discuss the distinction Kant draws between formality and generality of logic and argue that he ultimately con ates the two notions. I argue further that Kant's views on the formality of logic rest on a series of non trivial assumptions concerning the nature of cognition. I document the way in which these assumptions were received in his successors. In the second part of the paper I focus on Bolzano's criticism of the Kantian position and his redefinition of the notion of form. I argue that while what contemporary, post-Tarskian philosophers generally understand as the formality of logic ought to be traced back to Bolzano there are also important differences between the two positions."

41.   ———. 2012. "Bolzano and Kant: Introduction." *Grazer Philosophische Studien* no. 85:1-10.

42.   ———. 2014. "Bolzano, Quine and Logical Truth." In *A Companion to W.V.O. Quine*, edited by Harman, Gilbert and Lepore, Ernie, 296-312. Malden: Wiley Blackwell
"In this paper, I compare Quine's discussion of logical truth to Bolzano's theory of "logical analyticity". It is by now a received view that Bolzano largely anticipated Quine's views on logical truth, a conclusion Quine himself was retroactively prompted to draw:
"[M]y much cited definition of logical truth was meant only as an improved exposition of a long-current idea. So I was not taken aback at Bar-Hillel's finding the idea in Bolzano [...]" (Quine 1960, 65; see also 1966b, 110)."
According to the standard interpretation, the similarity between Bolzano and Quine comes from the fact that they are both "demarcating logic [...] with the help of a set of logical particles which are held constant, while the other non-logical expressions are freely substituted for each other".(3) This interpretation assumes that Bolzano and Quine share at least some substantial views about what makes a term a "logical" term. I think that this interpretation is largely mistaken. My paper has four parts. In the first part, I give some background to Bolzano's theory, focusing on his views on syntax and form. In the second part, I show why it is mistaken to assume that Bolzano and Quine mean the same when they speak of logical concepts/words. In the third part of the paper I discuss Bolzano's views on logical truth and sentences that can be turned into logical truth by putting synonyms for synonyms. I conclude by asking whether Bolzano's position allows him to fulfil the epistemic requirement (and answer, with a twist, in the affirmative)." (p.297).
(3) "Comments on Quine" (Føllesdal 1980, p. 29, my emphasis).
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Føllesdal, Dagfinn (1980). Comments on Quine. In S. Kanger and S. Öhman (eds.). *Philosophy and Gramma*r (29–35). Dordrecht: Reidel.
Quine, W.v.O. (1960). *Word and Object*. Cambridge, MA: MIT Press.

Quine, W.v.O. (1966b). Carnap and Logical Truth. In *The Ways of Paradox* (107–132). Cambridge, MA: Harvard University Press.

43.   ———. 2014. "Bolzano and the Analytical Tradition." *Philosophy Compass* no. 9:96-111

Abstract: "In the course of the last few decades, Bolzano has emerged as an important player in accounts of the history of philosophy. This should be no surprise. Few authors stand at a more central junction in the development of modern thought. Bolzano's contributions to logic and the theory of knowledge alone straddle three of the most important philosophical traditions of the 19th and 20th centuries: the Kantian school, the early phenomenological movement and what has come to be known as analytical philosophy. This paper identifies three Bolzanian theoretical innovations that warrant his inclusion in the analytical tradition: the commitment to 'logical realism', the adoption of a substitutional procedure for the purpose of defining logical properties and a new theory of a priori cognition that presents itself as an alternative to Kant's. All three innovations concur to deliver what counts as the most important development of logic and its philosophy between Aristotle and Frege. In the final part of the paper, I defend Bolzano against a common objection and explain that these theoretical innovations are also supported by views on syntax, which though marginal are both workable and philosophically interesting."

44.   ———. 2014. "Bolzano's Logical Realism." In *The Metaphysics of Logic*, edited by Rush, Penelope, 189-208. Cambridge: Cambridge University Press

"Bolzano's *Theory of Science* (1837) presents the first explicit and methodical espousal of internal logical realism. It also contains a formidable number of theoretical innovations. They include (i) the first account of the distinction between "sense" (*Sinn, Bedeutung*) and "reference" (or "objectuality": *Gegenständlichkeit*), (ii) definitions of analyticity and consequence, i.e. "deducibility" (*Ableitbarkeit*) based on a new substitutional procedure that anticipates Quine's and Tarski's, respectively, and (iii) an account of mathematical knowledge that excludes, *contra* Kant, recourse to extraconceptual inferential steps and that is rooted in one of the earliest systematic reflections on the nature of deductive knowledge. (i)–(iii) all assume the existence of mind - and language-independent entities Bolzano calls "propositions and ideas in themselves" (*Sätze an sich*). Take (i) for instance. Appeal to propositions in themselves in this context serves Bolzano's antipsychologism in logic: according to Bolzano, the sense (*Sinn*) of a sentence – the proposition it expresses – is to be distinguished from the mental act in which it is grasped. Just like what is the case in Frege, a sentence has the semantic properties it has (e.g. truth) on Bolzano's account derivatively, by virtue of its relation to mind-independent entities: the primary bearers of semantic properties are the propositions that constitute their *Sinne*." (p. 195)

45.   ———. 2017. "Bernard Bolzano." In *Sourcebook in the History of Philosophy of Language: Primary source texts from the Pre-Socratics to Mill*, edited by Cameron, Margare, Hill, Benjamin and Stainton, Robert J., 1029-1032. Dordrecht: Springer

"The views on language of Bernard Bolzano (1781–1848) overlap with two traditions. On the one hand, Bolzano tries to make sense of the idea that the signs we use designate ideas. On the other hand, Bolzano's theory is underpinned by a series of semantic and epistemological analyses that yield the first philosophical treatment of linguistic signs as endowed with both meaning and reference, understood in the contemporary sense. The resulting theory is an interesting combination of elements of post-Lockean epistemologies with a clear anticipation of post-Fregean semantics." (p. 1029)

46.   ———. 2018. "Bolzano's Philosophy of Mind and Action." In *Philosophy of Mind in the Nineteenth Century*, edited by Lapointe, Sandra, 42-59. New York: Routledge

"In spite of the overwhelmingly sympathetic consensus on the significance of Bolzano's contribution to theoretical philosophy, little attention has to this date been paid to his views on mind."
(...)

"The present chapter is an attempt to go some way toward such an understanding. The first part of the chapter offers a brief comparison of Bolzanian and Brentanian views on representation and judgement. A brief survey of Brentano's main positions is informative as a theoretical point of comparison for Bolzano's own views. At the very least, it is helpful to have the Brentanian theory in mind when gauging the impact - however humble - Bolzano effectively had on the theories of mind of some of Brentano's students.(4) The comparison however does not fully do justice to Bolzano's views. This is mainly because Bolzano's approach to the philosophy of mind and action has more to share with contemporary theorists than with any of his predecessors or successors in the 19th century. This claim is likely to arouse perplexity. Bolzano puts forward his views on mind in *Athanasia* (1827), a treatise in which a hefty metaphysics of substance is put to work for the purpose of proving the immortality of the soul, a context which *prima facie* is unlikely to afford much relevance. Those who have discussed Bolzano's views on mind, with few exceptions, have however consistently missed what is most remarkably interesting about them. First, the framework within which Bolzano develops his metaphysics of mind and agency is not dualistic and presents some anticipation of what will later be known as "neutral monism".(5) Second, the conceptual resources that are deployed to make sense of the way in which "body" and "soul" interact in living beings presuppose an understanding of organisms that goes against - or far beyond - much of what Bolzano's contemporaries and successors in the the 19th century wrote on the topic, especially the Idealists. More importantly, Bolzano puts forward an account of rational agency based on a theory of mind that anticipates crucial aspects of contemporary discussions on the role of intentions as "reasons" or "causes" for action. In the second and more substantive part of the paper, I focus on Bolzano's views on the ontology of mind and rational agency." (pp. 42-43)

(4) For a more detailed presentation of Brentano's views on mind, see Rollinger *infra*; see also Kriegel (forthcoming). [2017]

(5) For a discussion of Mach's view on neutral monism, for instance, see Banks, *infra*.

References

Erik C. Banks, *Ernst Mach' Contributions to the Philosophy of Mind*, same volume, pp. 77-95.

Robin D. Rollinger, *Brentano's Early Philosophy of Mind*, same volume, pp. 168-185.

Uriah Kriegel, "Brentano Concept of Mind" in *Innovations in the History of Analytical Philosophy*, Sandra Lapointe and Chris Pincock (eds.), Houndmills, Palgrave Macmillan, 2017.

47.　　　———. 2019. "Bolzano on Logic in Mathematics and Beyond." In *Logic from Kant to Russell: Laying the Foundations for Analytic Philosophy*, edited by Lapointe, Sandra, 101-122. New York: Routledge

"According to standard narratives, the origins of formal logic as we know it are to be found within the push toward logicism, axiomatisation and the foundations of set theory for which Frege's foundational project in mathematics often serves as muster. Frege, however, was by no means the first logician of the 19th century to seek to provide a new logical foundation to mathematical knowledge. At least one other author was driven by concerns, insights, ambitions and philosophical acumen that were as remarkable as Frege's. This author's efforts too resulted in a fullscale logical system whose conceptual resources, while they do not have the elegance and simplicity of Frege's "concept-script", are nonetheless as rich as those of first-order predicate calculus and powerful enough to generate Russell's paradox.(2) This author is Bernard Bolzano." (p. 101)

(2) Cf. Simons (1997) and Lapointe (2011, Chapter 3).

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Lapointe, Sandra (2011) *Bolzano's Theoretical Philosophy*, Houndmills, Palgrave.

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48. ———. 2022. "Bolzano's Theory of Satz an sich." In *The Routledge Handbook of Propositions*, edited by Tillman, Chris and Murray, Adam Russell. New York: Routledge

49. Lapointe, Sandra, and Armstrong, Chloe. 2014. "Bolzano, Kant, and Leibniz." In *New Anti-Kant*, edited by Lapointe, Sandra and Tolley, Clinton, 272-290. London: Palgrave Macmillan

"Both historically and philosophically Bolzano's contribution to philosophy is to be understood within the context of the reception of Kant's critical philosophy, or so we will argue. This claim is also likely to be controversial. Bolzano's contribution to philosophy, and in particular his contribution to the epistemology of logic and mathematics, is more often than not positioned in stark opposition to Kant's, in the intellectual lineage of Leibniz. What we are proposing is deliberately meant to upset this picture. Bolzano's relationship to critical philosophy is far more complex than what is generally assumed. For one thing, Bolzano's relationship to Kantian philosophy is not exhausted by his relationship to Kant. Bolzano paid close attention to the logical theories of those who followed in Kant's stride, the "new logicians" (Bolzano's term), and he discussed their views in at least as much depth as he did Kant's. What's more, Bolzano sought to determine what is distinctive of the "new logic" and thus offered a philosophical reflexion that is still, even today, enlightening when it comes to understanding this aspect of the reception of Kant's first *Critique*." (pp. 273-274)

(...)

"Of course, there are connections between Bolzano and Leibniz. But Bolzano discusses Leibniz's work in fact comparatively rarely. We find over the some 2400 pages of the *Theory of Science* (1837) a mere 30 references to Leibniz, mostly to the *Nouveaux essais* (1704) – compare this with the some 150 references to Kant, and some 200 to Kiesewetter.[*] It is not only that the number of references is small, but also that many references are in footnotes, even in the sections entirely devoted to discussion of the views of other philosophers." (p. 275)

[*] Kiesewetter, Johann Gottfired Karl Christian. (1806). *Grundriss einer allgemeinen Logik nach Kantischen Grundsätzen*. Berlin: Lagarde.

50. Lapointe, Sandra, and Tolley, Clinton, eds. 2014. *New Anti-Kant*. London: Palgrave Macmillan

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PART II: 4. Clinton Tolley: Bolzano and Kant on Space and Outer Intuition 157; 5. Nicholas F. Stang: Kant, Bolzano, and the Formality of Logic 192; 6. Timothy Rosenkoetter: Kant, Bolzano, and Moore on the Value of Good Willing 235; 7. Sandra Lapointe and Chloe Armstrong: Bolzano, Kant and Leibniz 272; Index 291-295.

"A unique philosophical dialogue
The present volume contains an altogether remarkable document in the history of nineteenth-century philosophy: a critical commentary on he most influential systematic work (the *Critique of Pure Reason*) of one major philosopher (Kant), written from the point of view of another major systematic philosopher (Bolzano), just decades after the former's publication. Bolzano, at the height of his powers, and with his mature philosophical views having fully taken shape with the publication of his Theory of Science (1837), undertakes the project of engaging, key point by key point, with Kant's masterwork. In collaboration with Bolzano, Frantisek Prihonsky (who would ultimately publish the final record of this work in 1850, shortly after Bolzano's death) both compiles a comprehensive and thorough summary of the main definitions, theses, and arguments in Kant's book, and then proceeds to bring to light the most important unclarities, confusions, and fallacies that he finds each

step along the way. The result, *New Anti-Kant*, is not only an extremely useful and even-handed overview of the entire first *Critique* itself - including parts often neglected by even Kant's most sympathetic readers - but also a catalogue of philosophically insightful and textually well-grounded challenges to signature Kantian doctrines. This work helps us to see anew the overarching contours of Kant's philosophy, and brings a fresh focus onto deep points of tension within Kant's system - all the while serving to introduce us, through instructive contrast, to the powerful alternative perspective that Bolzano develops in his own systematic philosophy." (pp. 3-4).