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Commentary on: G. Boger's "A Possible *Rapprochement* of Informal Logic with Formal Logic"

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These comments are directed at the version of Professor Boger's paper delivered at the conference. While that paper has now been revised, the commentary remains pertinent to the substance of what is said. –Eds.

I don't find it difficult to agree with Professor Boger on the "ontic" status of the quality of an argumentation. This is not difficult for me since my philosophical role model is Bernard Bolzano, who is famous for introducing into logical theory propositions or sentences "in themselves." All logical relations are defined on these structures whose principal property is that they can be true or false. In Bolzano, logical properties, validity, consequence, etc. are indeed ontic properties. To appreciate Bolzano's contribution we need only look at the understanding of logic in the 18th century, when it was assigned the task to explain the actual workings of the mind. Logic, it was said, is to the mind what physics is to matter.¹

But we must be cautious. Propositions are abstract objects that are defined by the structures in which they occur. This is not a very deep or problematic thought and can be explained using an analogy with money (fiat, not commodity or fiduciary money). When we know what it means to buy, to sell, to earn interest, to debit an account, etc. etc., and realize that coins and bills don't *become* money until an account is debited, then we understand what money, or even what a dollar or a mark, really is. There is then no further question, no enlightenment by contemplating the *relata* of these various relations.

It is a mistake to think of abstract objects, in particular those that live within structures, as occupying a Platonic or even mystical realm. Money may be mysterious, but it does not occupy a realm that is somehow beyond the world. Abstract objects, if I may say so, are right among us. And so it is with propositions.

Bolzano reminds us of this when he says that what we say often implies our belief that there are propositions (just as we believe that there is money).

Once it is recognized that it is necessary or even simply useful to speak of truths in themselves, i.e. to speak of truths irrespective of whether or not they have been recognized by anyone, and especially of the connection between them, then it will not be denied that the concept of propositions in themselves in the indicated sense deserves to be introduced into logic.²

This, I think, can be read as saying that the business at hand is to investigate the relations between propositions without asking for the essence of the *relata*, to assume a relaxed attitude toward these abstract objects, and not to worry too much about their status.

This creates certain problems for Professor Boger's staunch endorsement of classical logic (which is bi-valent, with excluded middle). If the essence of the proposition is defined by the structure in which it lives, than we must expect, and will find, that the great variety of structures that can be designed lead to a greater variety of types of proposition than Boger wants to countenance. Sometime around the middle of the last century the Age Aquarius began to dawn for formal logic, when logicians began to do their own thing, which meant an explosion of logic systems: modal, para-consistent, relevance, quantum, intuitionist, many-valued, etc. etc. Boger writes "Formal logic has developed the notion of precision in thinking as exemplified in, for example, the ideal of a logically perfect language." These days most formal logicians would deny that there is a logically perfect language. That ideal was still much argued in the 1950s, and arose from the conviction that most metaphysical conundrums, religious and political problems and even fanaticism had their root in the irrationality of ordinary discourse. We hear the following:

On one of their walks, Bertrand Russell startled Lady Ottoline by announcing that he found it difficult to talk to ordinary mortals, "for the language they use is so inaccurate that to me it seems absurd."³

Indeed, the bivalent logic of *Principia Mathematica* was thought by some (e. g. Gustav Bergmann) to be the ideal language. A classical text expressing great confidence in the salutary effect of formal logic instruction is Lillian Lieber's *Mits, Wits and Logic* of 1947, where Mits is the famous man in the street and Wits, obviously, the woman in the street.⁴

Lieber advocated universal logic instruction to prevent the recurrence of irrationality, as in Nazism, and avoid a nuclear confrontation. Since this would take a long time, universal disarmament and an international police force was needed as an emergency measure: a race is on between logic education and catastrophe (p. 50).

Lieber (who uses line-lengths scientifically adjusted to maximize comprehension) says:

If you realize that...
ONE WORLD
has now become
IMPERATIVE...
then
you may wish to read more about
LOGIC,
for you will need it
if you are here
"to tell the tale"(182 f.).

Since *Principia* Logic does not allow for first person expressions (there is no "I" there, nor actually a "there"), egoism will diminish and communitarian democracy will prevail.

With the proliferation of logic systems, faith in an ideal language has diminished. Not only that, formal systems are designed to answer metaphysical desiderata, or views concerning the nature of mathematical proofs. Logic systems have become task oriented. For example, many mathematicians embrace intuitionist logic, which does not have a law of excluded middle, and a good thing it is.

Consider this problem: can an irrational number raised to an irrational power be a rational number? With the law of excluded middle an easy but unhappy proof can be constructed: Take $\sqrt{2}^{\sqrt{2}}$. Either this is rational or it is not (excluded middle). If it is, then you are done. If it is not, then raise $\sqrt{2}$ to the power of that number, which is the same as $\sqrt{2}$ squared, or 2. You are done, but have you succeeded?

In sum, if propositions were as ontologically robust as Boger takes them to be, then one could speak with more assurance of their properties. But they are defined by their contexts, and the contexts are developed to meet certain extra-logical objectives. Hence much of what he says must be viewed with caution.

No doubt the discipline of formal logic can inform and advance argumentation theory. But there are certain limits that need to be heeded. Consider Aristotle on the syllogism:

A syllogism is a logos in which, certain things having been laid down, something other than what has been laid down follows of necessity from their being so (*Prior Analytics* 24b18).

"Syllogism" is here not taken in the technical sense developed later, but means to cover deductive arguments in general. It is important to note that Aristotle does not first define "argument in general" and then "valid argument" as a species of arguments. Rather he directly and only defines "valid argument," a practice that formal logic has followed ever since. Obviously, if some speech act fails to be a valid argument, it need not be an invalid argument, but could be a sonnet or a limerick. A system that contains only a definition of "valid argument" cannot well come to grips with arguments in general, with arguments that fail, with arguments that need to be supplemented.

Professor Boger is more careful and does indeed define "argument" (and later "argumentation").

Let us define a premise-conclusion (P-c) argument to be a two-part system consisting in a set of propositions called premises (P) and a single proposition called a conclusion (c). In a valid argument the premise propositions imply the conclusion proposition; the conclusion proposition is a logical consequence of the premise propositions.

Suppose you find a basket of propositions (comprehensible, no tricks), each on a separate slip of paper. You comb through them to determine if there are *valid arguments* in the basket, that is, systems that fulfill Boger's or some other definition of validity. This is a doable thing. You remove all valid arguments, leaving a remainder of propositions that cannot be arranged in systems that are valid arguments. Are there then any *arguments* left in the basket? I should think not. "*Valid argument*" is defined syntactically or semantically in such a way that they can be selected from random collections of sentences. But the same is not true for arguments in general. A speech act is an argument if some of the sentences in the system are *presented* or *meant* as premises, others as conclusions. Arguments are inevitably wedded to the intensions of their authors and cannot be understood without them.

To illustrate, a while ago Michael Burke analyzed a number of cases of "denying the antecedent" in logic text books. An example:

Total pacifism is a good principle if everyone follows it. But not everyone follows it. Therefore it is not a good principle.⁵

It instantiates a logical fallacy and formal analysis, indeed just a truth table, can easily show this to be invalid. But why then is it so persuasive? Is this due to a universal weakness of human reason, or is there some other explanation? Burke suggests that only the categorical sentence is meant as a premiss, the conditional playing another role too complex to review here. What we have, then, is an enthymeme, with an additional commentary. Formal analysis of this discourse shows it either to be a notorious fallacy, or, if Burke is right, another, nameless, fallacy. For the formal logician, enthymemes typically remain below the radar screen, cast into the same darkness as the grossest non-sequiturs: according to Boger, *any* argumentation whose conclusion is not a logical consequence of the premiss set is a fallacy. This is pretty harsh. Enthymemes have interesting *formal* properties, and, indeed, can be separated into valid and invalid.⁶

One last point. Boger writes:

Another way of expressing validity is to say that in a valid argument all the information in the conclusion proposition is already contained in the premise propositions (Corcoran 1998).

In the classical system he describes, an inconsistent premiss set implies every conclusion. Accordingly, an inconsistent set of sentences contains all the information there is. This can't be so.

In sum, I disagree with a number of details in Boger's argument, but am in sympathy with its general drift, particularly if he agreed to let go of the monopoly of classical logic. One task of discourse analysis must indeed be the analysis of abstract objects and their relations, which is an investigation of their ontic properties.

Notes

¹ Cf. Rolf George, "Psychologism in Logic from Bacon to Bolzano," in Dale Jacquette, ed. *Philosophy, Psychology and Psychologism*. Dordrecht (Kluwer) 2003, pp. 21 – 50.

² Bernard Bolzano, *Theory of Science*. Ed. Rolf George, U. of California Press 1972, § 20.

³ Ray Monk, *Bertrand Russell*, London (Jonathan Cape) 1996, p. 436.

⁴ Lillian and Hugh Lieber, *Mits, Wits and Logic*. New York (Norton) 1947.

⁵ Michael H. Burke, "Denying the Antecedent: a Common Fallacy?" *Informal Logic* 16.1, 1994, 23-30. The example is from Copi and Cohen, *Introduction to Logic*, N.Y (MacMillan) 1990, p. 224.

⁶ Rolf George: "Enthymematic Consequence", *American Philosophical Quarterly* 9.1, 1972, 113-116.