Logic, Language, and Knowledge. Essays on Chateaubriand's ***Logical Forms***
Walter A. Carnielli and Jairo J. da Silva (eds.)

CDD: 160

LOGICAL FORMS AND LOGICAL FORM: RESPONSE TO JOHN CORCORAN

OSWALDO CHATEAUBRIAND

Department of Philosophy
Pontifical Catholic University of Rio de Janeiro
Rua Marquês de São Vicente, 225, Gávea
22453-900 RIO DE JANEIRO, RJ
BRAZIL

oswaldo@puc-rio.br

Abstract: In his paper John Corcoran examines in detail many issues relating to logical form, and raises some questions about my formulations. In my response I emphasize two main distinctions that may clear up some of the issues. One is the distinction between logical forms, in the sense of logical properties of an abstract character, and logical form, in the sense in which we speak of the logical form (or logical structure) of a sentence, or of a proposition. Another is the distinction, emphasized by Boole, between primary propositions (about things), and secondary propositions (about propositions)—which I illustrate through the distinction between predicate negation and sentential negation.

Keywords: Logical Forms. Logical form. Logical property. Predication. Negation.

FORMAS LÓGICAS E FORMA LÓGICA: RÉPLICA À JOHN CORCORAN

Resumo: Em seu artigo John Corcoran examina em detalhe muitas questões sobre forma lógica e levanta alguns problemas relativos à minhas formulações. Na réplica enfatizo duas distinções principais, que podem esclarecer algumas questões. A primeira é a distinção entre formas lógicas, no sentido de propriedades lógicas de caráter abstrato, e forma lógica, no sentido em que falamos da forma lógica (ou estrutura lógica) de uma sentença ou de uma proposição. A segunda é a distinção, enfatizada por Boole, entre proposições primárias (sobre coisas) e proposições secundárias (sobre proposições), exemplificada com a distinção entre negação predicativa e negação sentencial.

Palavras chave: Formas lógicas. Forma lógica. Propriedade lógica. Predicação. Negação.

In his paper John discusses my work positively and sympathetically within the context of a detailed examination of several different issues relating to logical form. He raises various critical points along the way, and at the end of his conclusion lists what he considers to be three major deficiencies of my treatment of logical forms. These are: (1) that I have not established my "key proposal that the objects previously called logical forms of propositions (or of interpreted sentences) are actually properties of complex objects"; (2) that I have failed "to determine what the traditional views were and what role logical forms actually served in metalogical discourse"; and (3) that I have failed "to treat the most prominent types of logical forms: the logical forms of arguments, argumentations, proposition sets, and theories—complexes having propositions as components." I begin with some comments on a few questions and objections raised in the initial sections of the paper, and then go on to discuss the more general issues related to these three criticisms.

1. PRELIMINARY REMARKS

(1) Although I do not think there is "a" linguistic view of logic, but a plurality of such views, I do refer in many places to what I call "the linguistic view of logic"—with which I associate an equally "linguistic" view of logical form—and in Chapter 15 discuss the basic characteristics of such views. In particular, I criticize Quine's (1970) formulations as a recent and influential treatment along these lines.

At the beginning of the chapter I make some general remarks about the "usual way of characterizing logical form" in terms of syntactic structure. I suggest that logical form is characterized in terms of formal languages, and that the terms, formulas, and sentences of these formal languages are syntactic structures, which are taken to be (or to represent) the logical forms of terms, predicates, and sentences of ordinary language. Thus, Quine introduces the "logical grammar", which I discuss on pp. 121ff, and Church (1956, pp. 2-3) says that in order to avoid confusions generated by similarity of grammatical form

> it is desirable or practically necessary for purposes of logic to employ a specially devised language, a *formalized language*, as we shall call it, which shall reverse the tendency of the natural languages and shall follow or reproduce the logical form … . To adopt a particular formalized language thus involves adopting a particular theory or system of logical analysis.

With respect to the question "How can sentences be logical forms when logical forms are forms of sentences?" John asks after quoting the first paragraph of Chapter 15, my point is that it is the sentences (syntactic structures) of the formal language which are taken to be (or to represent) the logical form of the sentences of the natural language. And with respect to the question as to who characterizes logical forms in this way, the above passage by Church seems to me to express the "usual view" among logicians and philosophers.

(2) On pp. 228 John correctly observes that I use the term 'property' as a general term, including relations as well, although when I am talking specifically about relations I also use the term 'relation'. But then he says that in some contexts I take

> multi-place relations as special one-place properties, e.g., taking a two-place relation *to have* an ordered pair *as an element* rather than as *relating* one thing *to* another (2001, 61, 191, 202).

He considers this to be "ontologically remarkable", and so would I, were I treating of relations in the intensional sense in which I treat properties. On the pages to which John refers, however, I am giving set-theoretic formulations, and, as usual in set-theory, I am treating *n*-ary relations as sets of ordered *n*-tuples. I do not see anything remarkable about this, which is the common practice in set theory.

(3) On the same page, John raises an issue about my use of the expression 'logical property' in relation to Tarski's use of the expression 'logical notion', and my lack of reference to Tarski (1986) in the two volumes of *Logical Forms*. Curiously enough, although I had known Tarski's paper for many years when I developed the notion of logical property presented in Chapter 9, I did not make a connection with his work. It was only when Frank Sautter (2004) raised the question of the relation between my characterization of logical properties and Tarski's characterization of logical notions that I saw the connection, which I then discussed in some detail in my reply—but by then the first volume of *Logical Forms* had been published, and the second was in press.

But let me now turn to the main issues, beginning with the ontological question raised by John on p. 226.

2. LOGICAL FORMS

The first version of my book was titled "The Laws of Truth", involving an explicit reference to Frege's beautiful passage in "Thoughts"—quoted in the Introduction, p. 34—where he says that whereas "[t]o discover truths is the task of all sciences; it falls to logic to discern the laws of truth." As the book progressed, however, an abstract notion of property deriving from Plato's notion of Form[1] became more and more central, and I decided to change the title to "Logical Forms". Thus, the word 'form' in my title is not a

[1] In order to avoid misunderstandings I will capitalize 'form' when used in this sense.

reference to the "usual" notion of form of a sentence, or form of a proposition, or form of an argument, but is a reference to Platonic Forms. Just as we talk of ethical Forms, aesthetic Forms, mathematical Forms, we can talk of *logical* Forms. Moreover, since I see Frege's introduction of higher-order concepts as a major step toward the development of the theory of logical Forms, I chose as epigraph for the book (p. 7) a passage where Frege emphasizes the distinction between concepts of the same order and concepts of higher order. I go back to this issue at many points in the two volumes, and, finally, in the Epilogue, I discuss Plato's treatment of Forms in the *Parmenides*, and what I see as Frege's (implicit) answers to some of the puzzles raised in that dialogue.

As opposed to other books that discuss logical form, it was never my intention to survey the logical and metalogical treatment of this notion, either in relation to propositions and sentences, or in relation to arguments and theories.

Logical Forms—to which I also refer as 'logical properties'—are characterized as certain "universal" properties in an ontological hierarchy that includes particulars, properties, and states of affairs. There are infinitely many logical properties at all property levels, including such properties as Existence, Non-Existence, Identity, and Difference, which first appear at level 1. Beginning at level 2 we have such properties as Application (or Instantiation), Existential Quantification, Extensional Subordination, Null-ness, One-ness, Two-ness, etc., as well as infinitely many others. Since I describe this notion of logical property in several chapters, I will not expand on it here.

I see various systems of logic as being partially characterized as theories of specific logical properties. Thus, Aristotelian logic can be characterized, at least in part, as being a theory of the four logical properties Subordination, Exclusion, Partial Subordination, and Partial Exclusion. These are level 2 binary relations that relate level 1 unary properties, and are usually expressed linguistically as: All *A* are *B*; No *A* is *B*; Some *A* is *B*; and Some *A* is not *B*.

Fregean predicate logic is a much more complex theory of infinitely many logical properties that include Application properties of various types, Quantification properties of various types, Identity and Diversity properties of various types, etc.—and, in particular, it includes the Aristotelian properties.

Although classical propositional logic is imbedded in Frege's theory, I treat it separately as a theory of the logical properties Truth and Falsity, and of infinitely many logical truth-relations among propositions.

3. LOGICAL FORM

Let us consider the example

(1) Frege taught Carnap,

which John discusses on pp. 253-255. Perhaps the best way to state my position about the "usual" notion of logical form is to say that (1) *does not have a logical form*. More specifically, there is no such thing as *the* logical form of a sentence or of a proposition—at least in the usual sense in which the term 'proposition' is used in the literature as "what is expressed by a declarative (interpreted) sentence."

I derive this view from Frege's argument that we can analyze the structure of (1) in many different ways in terms of the predicate (function) and argument(s) distinction, which John expresses clearly and correctly in terms of his formulations (11e)-(14e). This is the reason for saying that *there are different interpretations of the logical structure of* (1), and that *these interpretations exemplify different logical Forms* (properties). Thus, (11e) exemplifies Application of type

<<2,3>,<<1,2>,0,0>>>, whereas (12e) and (13e) exemplify Application of type <<2,2>,<<1,1>,0>>>, and (14e) exemplifies Application of type <<3,2>,<<2,1>,<1,2>>>. The readings suggested by John nicely express these distinctions, and I reproduce them with some slight variations:

(11e) The having-taught relation relates Frege to Carnap

(12e) Having-taught-Carnap belongs to Frege

(13e) Being-taught-by-Frege belongs to Carnap

(14e) Relating-Frege-to-Carnap belongs to the having-taught relation.

I think it is quite clear from these formulations that the logical Forms expressed are:

(11e) a level 1 binary relation applying to two individuals (level 0),

(12e)-(13e) a level 1 unary property applying to one individual,

(14e) a level 2 unary property applying to a level 1 binary relation,

and this is precisely what I indicate by the Application relations of different types.

As to John's ensuing question (p. 256) concerning the range of applicability of the logical properties (Forms), my answer is that they apply to *any* entities that accord with their type. This is one sense in which logical properties are universal. Another sense in which they are universal is that they "appear" at all levels of the hierarchy above the initial level at which they appear. Thus, Application relations appear at level 2—and there are infinitely many of them, including Application relations of infinite arity and Application relations of multiple arities—as well as at all levels higher than 2. Moreover, since I hold that properties can accumulate, at any level there are cumulative Application relations of many different types. But, of course, there are no "absolute" Application relations because the hierarchy does not have an upper limit. And exactly the same thing holds for all other logical properties.

4. PREDICATE NEGATION AND SENTENTIAL NEGATION

An important issue I discuss in many parts of *Logical Forms*, as well as in several papers, is the distinction between predicate negation and sentential negation, and John makes some remarks about it on pp. 244-246.

In ordinary language, and in predicate logic, we use negation both as predicate negation, as in

(2) John is not a dentist,

and as sentential negation, as in

(3) It is not the case that John is a dentist.

Since to say that it is not the case that John is a dentist actually means that *it is not true* that John is a dentist, sentential negation also operates on a predicate; namely, the predicate 'is true'. Hence, in fact, the structural ambiguity to which I refer in some places is really a *misunderstanding* by (many) logicians and philosophers of the proper interpretation of negation.

As I point out in Chapter 6 (p. 209, note 4), this was clearly perceived by Boole when he makes the distinction between *primary propositions* (those that are about things) and *secondary propositions* (those that are about propositions). If I say that John is a philosopher, I am saying something about *John*, and I am stating a primary proposition. If I say that it is true that John is a philosopher, I am saying something about the *proposition* that John is a philosopher—namely, that *it* is true—and I am stating a secondary proposition. Similarly, (2) is a primary proposition about John, which often gets *misinterpreted* as (3), which is a secondary proposition about the proposition that John is a dentist.

This issue is particularly relevant when we are dealing with truth-valueless sentences; for if a sentence is neither true nor false, then its predicate negation is also neither true nor false, whereas its sentential negation is true. Thus, if we hold that the sentence

(4) Sherlock Holmes is a dentist,

is neither true nor false, because the name 'Sherlock Holmes' does not denote, then we should also hold, for the same reason, that the sentence

(5) Sherlock Holmes is not a dentist

is neither true nor false.

The sentential negation 'it is not true that' ('it is not the case that'), on the other hand, *always* gives a truth-value, because if a sentence is neither true nor false, then it is not true, and its sentential negation is true. Thus, as opposed to the predicate negation (5), which is neither true nor false, the sentential negation

(6) It is not the case that Sherlock Holmes is a dentist

is true. And, of course, the sentential negation of a true sentence is false and the sentential negation of a false sentence is true.

It is also important to notice that the affirmation 'it is the case that'—i.e., 'it is true that'—also has the feature of always giving a truth-value; because if a sentence is neither true nor false, then to say that it is true is false. Thus, in the case of our sentence (4), the sentence

(7) It is true that Sherlock Holmes is a dentist

is false. And if a sentence is either true or false, then to say that it is true yields the same truth-value as the sentence itself.

There are two main reasons for confusing primary and secondary propositions in logic. One is that since one typically makes the assumption that all sentences (or propositions, or statements) are either true or false, the switch from primary statements to secondary statements does not affect truth-value. The second reason derives from a lack of appreciation for the role of predication in logic, which leads to a secondary interpretation of negation and of the other "connectives". Both of these issues are developed in great detail in *Logical Forms*.

5. PROOFS, ARGUMENTS, AND ARGUMENTATIONS

I dedicate several chapters of my second volume to a discussion of proof and justification, arguing that the notions of proof, argument, argumentation, etc., are not properly characterized by the sequences of sentences (or propositions) that are the common stock of logic books. I do not think there is a theory of the "logical form" of proofs, or arguments, or argumentations, in a general sense of these terms.[2] What there is are certain logical and mathematical techniques, or strategies, that can be used to characterize the "main form" of a proof, or of a part thereof. Thus, we may characterize the structure, or form, of a proof as a *reductio ad absurdum*, or as a *proof by cases*, or as a *proof by contraposition*, or as a *proof by induction*, and so on. It is true, as John says, that I do not discuss in detail the issue of logical form in this general sense, but I do make some remarks about form in Chapter 25 (pp. 436-441), both about deductive proofs and about inductive proofs.

REFERENCES

CHURCH, A. *Introduction to Mathematical Logic*. Princeton, N.J.: Princeton University Press, 1956.

FREGE, G. "Thoughts". In *Collected Papers on Mathematics, Logic, and Philosophy*, edited by B. McGuinness. Oxford: Blackwell, 1984.

QUINE, W. V. *Philosophy of Logic*. Englewood Cliffs, N.J.: Prentice-Hall, 1970.

SAUTTER, F. T. "Chateaubriand on the Nature of Logic". *Manuscrito*, 27, pp. 95-104, 2004.

TARSKI, A. "What are Logical Notions?" *History and Philosophy of Logic*, 7, pp. 143-154, 1986.

---

[2] Although I agree, of course, that just as there are formal theories of sentential forms there are formal theories of proof forms; as, for example, studied in proof theory, where proofs are generally represented as tree structures constructed in accordance with the rules of inference of a formal system.