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CHATEAUBRIAND ON SYMBOLISM AND LOGICAL FORM

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Abstract: The aim of this paper is to frame briefly Chateaubriand's conception of logical forms in the distinction between logic and language as calculus and logic as universal language, devised by Jean van Heijenoort and later generalized by Jaakko Hintikka. The most important reasons to connect Chateaubriand's conception with this distinction are perhaps Chateaubriand's criticism of the linguistic approach to logical forms and the role Chateaubriand assigns to symbolism in his own account.

Key words: Chateaubriand. Calculus and universal language. Logical symbolism.

CHATEAUBRIAND SOBRE SIMBOLISMO E FORMA LÓGICA

Resumo: O propósito deste artigo é localizar brevemente a concepção de forma lógica de Chateaubriand com relação à distinção entre lógica e linguagem como cálculo e lógica como linguagem universal, introduzida por Jean van Heijenoort e depois generalizada por Jaako Hintikka. Talvez a razão mais importante para conectar a concepção de Chateaubriand com esta distinção sejam suas críticas ao tratamento linguístico das formas lógicas, e o papel que Chateaubriand atribui ao simbolismo em seu próprio tratamento.

Palavras-chave: Chateaubriand. Cálculo e linguagem universal. Simbolismo lógico.

Logical Forms, in its two parts, presents a platonistic theory of logic and language. The theory is justified through many arguments, which pose a serious challenge to many important assumptions of the prevailing view in the philosophy of logic, and lead the reader to further reflection. In the first chapters of the second part of the book, Chateaubriand formulates the basic tenets of his conception of logical forms. In this paper I shall briefly frame this conception in the distinction between *logic as calculus* and *logic as universal language*. This distinction was devised by Jean van Heijenoort in a famous article in order to characterize two opposite trends in the earlier development of mathematical logic (see van Heijenoort 1967). The distinction was generalized by Jaakko Hintikka, who applied it on many occasions to the interpretation of 20th Century philosophy (see for example the introduction of Hintikka 1997). Originally, the distinction was related to the historical development of symbolic logic in the 19th Century. However, it is also useful to show the different philosophical assumptions in current work in logic, as Hintikka has shown. I think there are several reasons to connect Chateaubriand's conception with this distinction. The most important reasons are perhaps Chateaubriand's criticism of the linguistic approach to logical forms and the role Chateaubriand assigns to symbolism in his own account. I hope that the following notes can motivate further discussion.

In the introduction of Part I, Chateaubriand claimed that the fundamental character of logic is metaphysical, not linguistic. Logic is for him an ontological theory that is part of a theory of the most universal features of reality. Although he admits the important role played by linguistic notions in the development of logic, he rejects a linguistic or purely semantic conception of logic. So, Chateaubriand argues for an ontological conception of logic:

A large part of the aim of this book is to develop and defend such a metaphysical approach to logic, which involves also a critical evaluation of the basic claims and assumptions of the linguistic approach. (Chateaubriand 2001, p. 16)

Later, he characterizes the modern theory of logical forms as “a theory of propositional structure in terms of the categories of objects and properties and of specifically logical properties and operations.” (Chateaubriand 2001, p. 18) Through this characterization Chateaubriand seems to interpret the view underlying the classical expositions of modern logic - due mainly to Frege and Russell.

In the second part of the book, this key notion of logical form is analyzed specifically and related to syntax, semantic and grammar. As a consequence, the linguistic approach is severely criticized. At the beginning of chap. 15 Chateaubriand defines what he calls “the standard linguistic view” on logical forms as follows:

The standard linguistic view is that the logical forms are forms of sentences, and of other linguistic entities. Sentences, say, have a certain logical structure, and various logics, old and new, provide analyses of this logical structure. This structure is a syntactic feature of sentences; i.e., logical forms are syntactic structures. (Chateaubriand 2005, p. 109)

Logical notions like sentential connectives or quantifiers play an essential role in logical forms: They are *universal* in the sense that they are present in all sorts of discourse. Therefore, there is no specific logic for each language (English, Spanish or Chinese, for example); *logic is not language specific*. The universality of logical notions means that logic analyzes the *concepts* of negation, conditional, existential quantifier, etc. The specific languages are analyzed in order to identify words and expressions or phrases representing logical concepts, so that logical analysis is applied to specific languages without being a theory of specific languages (2004, p. 113).

According to the linguistic view, this analysis implies the formulation of a logical grammar, a logical syntax, in terms of which the logical form of sentences can be expressed accurately and logical forms can be conceived as concrete structures of some sort. In chap. 14, Chateaubriand remarks that syntactic structures are in fact *recursive* structures; they are constructed following recursive definitions of expressions that presuppose an infinite number of symbols. So, syntax deals not with symbols as discrete entities, but with *types*, that can be infinite. (pp. 74 f.). These types are abstract entities, that could be understood as something like equivalence classes of tokens from the relation “to have the same shape” (if it is possible to provide a good definition of it). In this respect syntactic structures are akin to mathematical structures in general. This leads Chateaubriand to talk of a “syntactic idealism” underlying the syntactic trend in logic.

On the contrary, according to Chateaubriand’s view, logical grammar presupposes an ontological and epistemological analysis, and the symbolism should be presented as a formulation of that analysis. For him, that is the case of Frege’s conceptual script, used to express linguistically a logical theory (p. 128). Therefore, the concept of logical form should be elucidated independently of notational systems, like the formal languages of logic, even if in fact they can be correlated with notational forms. Chateaubriand concludes:

My suggestion, therefore, is that the logical forms are the logical properties, and that we can, and do, use various systems of notation to represent these logical forms. (p. 132)

It must be noted that some advocates for the syntactic conception of logic are aware of the abstract nature of syntax. For example, Haskell B. Curry argues as follows:

There is, therefore a sense in which the primitive frame defines a formal system as a unique object of thought. This does not mean that there is a hypostatized entity called a formal system which exists independently of any representation. On the contrary, in order to think of a formal system at all we must think of it as represented somehow. But when we think of it as formal system we abstract from all properties peculiar to the representation. Human beings can think abstractly about quite concrete things without inventing mystic abstracta to account for the phenomenon. (Curry 1951, p. 30)

In a very traditional way, Curry would be defending here the idea that such abstract entities as logical forms are not independent of their representation in the formal languages. *We* are doing abstraction from language in order to think of logical forms. Therefore, an analysis of language and symbolism is enough to elucidate the nature of logic; an ontological investigation is not necessary. Of course, Curry's position presupposes an accurate theory of abstraction that is not explicitly provided by him.

Jean van Heijenoort wrote an influential paper, where he distinguished between two fundamental lines of thought in the history of modern logic, which would turn out to be an essential contribution to the historiography of modern logic. These are the conceptions of *logic as universal language*, represented mainly by Frege's conceptual script, and *logic as calculus* represented mainly by the algebra of logic (see van Heijenoort 1967). It has been considered the standard received view of the history of logic.

van Heijenoort took this distinction from Frege's own opposition between what he called *lingua characterica* and *calculus ratiocinator*, formulated in a paper published posthumously, in which he aimed to offer a better explanation of his intentions in writing *Begriffsschrift*. Thus, Frege claimed:

What I am striving after is a *lingua characterica* in the first instance for mathematics, not a *calculus* restricted to pure logic. (Frege 1880/1881, in Frege 1969, engl. transl. 1972, p. 12)

and later also:

I was trying, in fact, to create a ‘*lingua characterica*’ in the Leibnizian sense, not a mere ‘*calculus ratiocinator*’. (Frege 1883, p. 89)

With the expression ‘*lingua characterica*’, Frege meant a language with a fixed interpretation (a mathematical domain), serving “to express a content”, as Frege himself wrote. His conceptual notation was conceived not only as a formal language to avoid logical errors and ambiguity, but also as a *universal scientific language*, which would “fill the gaps in the existing formula languages” and “connect their hitherto separated fields into a single domain” (Frege 1879, p. 7). On the contrary, a *calculus* was conceived only as a symbolic system without a fixed interpretation, and it was intended to be a formal representation of logic for solving logical problems. It must be taken into account that Frege wrote this comment to answer criticism dismissing his own symbolic system as a mere *calculus* and not as a real *Begriffsschrift* or an universal language.

Many commentators of van Heijenoort’s papers also saw in them a distinction between the existence or not of quantification in the proposed systems. It is true that Boolean logic lacks quantification, but it would be introduced in the algebraic framework by Peirce. Quantification is not the hard core of the distinction, as van Heijenoort himself admitted:

the opposition between *calculus ratiocinator* and *lingua characterica* goes much beyond the distinction between sentential *calculus* and quantification theory. (1967, p. 12)

Summarizing van Heijenoort's interpretation of the distinction established by Frege, a calculus ratiocinator consists in a formal calculus that contains variables whose domain is left completely undetermined, that is, their universe of discourse can be changed at will. The same happens with the operations of the calculus: they may receive many different interpretations. In this sense, a calculus ratiocinator constitutes a mere syntactical system (in a very general sense of the word), whose semantics remains purely external to the system as such. Therefore, a calculus ratiocinator can be conceived as a help in our task of making inferences, but not as a means for substituting our ordinary language by a new and more perfect language.

In opposition to a calculus ratiocinator, a *lingua universalis* is provided with a fixed domain for its variables, so that they range over the universality of objects (and there is only one universe of objects, at least for Frege). For this reason, a *lingua universalis* as such cannot be mere syntax, since its expressions have to be meaningful. It must contain a semantic. In this sense, it can be said that in a *lingua characterica* semantics is internal to the system as such. Finally, a universal language is devised to replace the imperfect and misleading ordinary language, and it would be more appropriated for the practice of sciences (especially in the task of establishing the foundations of them).

With this distinction, van Heijenoort aimed to stress some features that are present in Frege's logic. Above all the *universality* of the *Begriffsschrift* should be mentioned. The logic refers to all the universe, and there is one fixed universe, as van Heijenoort said that is *the* universe (1967 p. 12). Another point stressed by van Heijenoort is the possibility of analyzing sentences, so that it can be really a *lingua*, and not like in Boole's logic, where sentences are unanalyzed and do not have a real (fixed) meaning. In the analysis Frege used his differentiation between functions expressions and

object expressions as a pattern (for representation of arithmetical facts). This feature is related with Frege's idea of analysis and with the special role it plays in his reconstruction of arithmetical notions.

Now, the universality of the domain of quantification seems to be an essential point in van Heijenoort's distinction. So, the distinction comes to be a *conceptual* and *normative* one rather than a purely historical one (it would be then a philosophical distinction concerning the nature of logic). It implies also some *valuation* of the different trends in the development of modern logic. Two different models of representation for logical reasoning are presented, but van Heijenoort takes for granted that real innovation is achieved firstly with Frege's conceptual script. As a result, logic as *lingua universalis* finally achieved preeminence in the development of mathematical logic at the beginning of the 20th Century.

It should be noted that in the opposition of calculus vs. language (at least according to van Heijenoort's original ideas) a broader problem is taken into account: the problem of the role played by symbolism in logic. In the algebraic tradition, the symbolism is introduced *as a formal representation in order to solve problems*. On the contrary, for Frege the symbolism has first a *descriptive* function (the description of the deepest structure of thought), that takes shape in the analysis of judgements. The conceptual script is for Frege *the* universal language in which the structure of logical forms can be accurately represented. In this sense its function is to *replace* ordinary language as a representational instrument.

Van Heijenoort introduced a closely related philosophical distinction in a talk given for the *Tercer Coloquio Nacional de Filosofía* at Puebla, Mexico, 1979 (van Heijenoort 1979). He made a distinction on that occasion between *absolutism* and *relativism* in logic:

Absolutism, in the sense in which the word will be used here, is the doctrine that there is one logic, that this logic is what has become known as classical logic, and, moreover, that such a logic is all-embracing and universal. Relativism is the opposite doctrine, it denies what absolutism advances. (van Heijenoort 1979, p. 75)

He mentions in this context Frege's distinction, and Frege would be clearly a defender of absolutism in logic. van Heijenoort conceived this distinction in both an epistemological and ontological way. For he believed absolutism to depend on some "extra-logical" intuition according to which the interpretation of symbols could be fixed (van Heijenoort 1979, p. 77).

van Heijenoort introduced here a further distinction in order to apply absolutism and relativism in logic. He distinguished between *logica magna*, a universal system with a fixed domain, and a *logica utens*, consisting of systems that are being introduced according to needs and different domains are successively considered for interpretations. He related also the distinction absolutism-relativism with the opposition between higher-order logic and first-order logic: "first-order logic is necessarily a *logica utens*, while a *logica magna* is necessarily a higher-order logic (but, in both cases, not conversely)" (1979, p. 82).

Later, this idea was reassumed by Jaakko Hintikka, with a broader scope, in a series of papers as the distinction between both language and logic as *calculus* and as a *universal medium*. He used it to understand, for example, the origins of model theory (see Hintikka 1988). But in Hintikka the distinction reflects above all some aspects of a differentiation between theoretical conceptions of language and logic. In this sense he used the distinction in order to make explicit what he called an "ultimate presupposition of 20th Century Philosophy". This presupposition can be expressed as the question as to whether language - ordinary language - "is universal in the sense of being inescapable" (Hintikka 1997, p. ix). Thus, he

connected the universalistic conception with idea of the *ineffability of semantics*, that is, that one cannot escape from the language, which is – in fact – the only and *unique* language possible. There is no possible metalanguage, and we can learn a language only by means of suggestions and clues.

Ontological problems are discussed more frequently in the universalist tradition, and they are more relevant for it: Because of its universality the language should also talk about logical forms. The universalist position presupposes a universal domain for the variables of the language. So, if logical forms are objects of some sort, they must be part of the universal domain and it should be possible to apply predicates to them and to quantify over them. Of course, this fact leads to recognition that the universal language must be a higher order language and logical notions are predicates of higher order. This was in fact Frege's position and Chateaubriand is, in this respect, in total agreement with it. The whole system developed by Chateaubriand in chapters 16 and 17 is formulated in a higher order language.

Now, in the standard formulations of logic we find the explicit use of schematic letters for predicates and sentences instead of variables for expressing logical forms. Schematic letters are “not objectual”: They refer to no objects as values. For example, predicate letters refer neither to properties nor to classes as values. They are not bindable and their function is purely substitutional: they admit appropriate expressions as substitutes. Schematic letters express *generality* instead of universality. They are generally applicable in different domains and, therefore, they do not presuppose a universal domain. The formulation of logical forms through schematic letters is more akin to the tradition of logic as calculus.

Chateaubriand seems to adopt a universalist approach to logic and language, and he should also endorse an absolutism in logic in van Heijenoort's sense. He agrees with Frege, for whom “the

universe of discourse was reality, and there were no interpretations and truths relative to interpretations” (Chateaubriand 2005, p. 210). So in the descriptions of logical forms only variables (quantified or free) and logical constants should occur.

Yet, Chateaubriand does not propose a universal formal language, a *Begriffsschrift* (in Hintikka’s sense). Unlike Frege, symbolism and notation are not so essential for his philosophical program. He considers notational systems like Frege’s conceptual script as a purely *pragmatic* element in logic – even if fundamental for the formulation of logical systems and for making deductions in them. A notation can go proxy for logical forms, but they are absolutely independent of it (see Chateaubriand 2005, p. 131). Therefore, logical forms are expressible in ordinary language, and notational systems only represent them in a more accurate way. The ultimate formulation of the universal logical forms is in the universal ordinary language.

In chap. 6 of the first part a higher order language is introduced and developed in a more systematic way in the second part, chaps. 16 and 17, but this language only plays the role of a syntactical device in order to present the *theory* of logical forms and could be replaced by ordinary language, and thus is a *logica utens* and not a *logica magna*. In fact this is the prevailing practice in symbolic logic after *Principia Mathematica*. However, the theory is supposed to be universal.

Now, if logical forms are not language specific and a universalist approach is adopted, implying this alleged “ineffability of semantics”, a linguistic view of logical forms could still be claimed. Logical forms that we try to establish in a precise way should be the logical forms of *the* language, the colloquial language, our language, which is impossible to capture. The different symbolisms should turn out to be only *partial* attempts to give an account of the structure of logical forms of ordinary language.

However, *the* language, in Hintikka's sense, is a very elusive and obscure entity, and we cannot talk about it. Following Wittgenstein and his *Tractatus*, its logical forms can only be *shown*. A platonistic approach like Chateaubriand's can be seen as attempting a way out of this situation.

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