Conceptual Realism as a Formal Ontology

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Abstract

Conceptualism *simpliciter*, whether constructive or holistic, provides an account of predication only in thought and language, and represents in that regard only a truncated formal ontology. But conceptualism can be extended to an Aristotelian conceptual natural realism in which natural properties and relations (and natural kinds as well) can be analogically posited corresponding to some of our concepts, thereby providing an account of predication in the space-time causal order as well. In addition, through a pattern of reflexive abstraction corresponding to the process of nominalization in language (and in which abstract objects are hypostatized corresponding to our concepts as unsaturated cognitive structures), conceptualism can also be extended to a conceptual Platonism or intensional realism that can provide an account of both the intensional objects of fiction and the extensional objects of mathematics. Conceptual realism is thus shown to be a paradigm formal ontology in which the distinctions between abstract reality, natural reality, and thought and language are properly represented, and in which the traditional opposition between Platonism and Aristotelianism is finally overcome by properly locating their different functions, and the way each should be represented, in formal ontology.

1 Introduction

A formal ontology is both a theory of logical form and a metaphysical theory about the ontological structure of the world. What makes it a theory of logical form is that different ontological categories or modes of being are represented in it by different logico-grammatical categories. It is specified in this

regard by what might be called an ontological grammar that determines how the expressions of those logico-grammatical categories can be meaningfully combined so as to represent different ontological aspects of the world.

There is more to a formal ontology than ontological grammar, however. In particular, besides determining the ways that the expressions of the different logico-grammatical categories can be meaningful combined, a formal ontology also determines the ways those expressions can be deductively transformed as well—i.e., the ways those expressions determine the valid formulas of that ontology. As a theory of logical form, a formal ontology involves not only an ontological grammar, accordingly, but also ontological laws determining the valid formulas of that grammar.

What is central and fundamental in determining both of these functions of a formal ontology as a theory of logical form is how the metaphysical system it represents interprets the nexus of predication. That is because, whether directly or indirectly, it is the nexus of predication that determines how the expressions of the different logico-grammatical categories of a theory of logical form can be both meaningfully combined and deductively transformed – which is to say that it is in terms of this nexus that the unity of the different categories or modes of being of the formal ontology in question is ultimately to be understood.

Historically, there are three major types of theories of predication corresponding to the three types of theories of universals that have been propounded. Here, by a universal, we do not mean just any abstract entity at all (such as a set or class, or even a number, as W.V. Quine would have it) but what has traditionally been understood ever since Aristotle – namely, an entity that can be predicated of things (*De Interpretatione*, 17a39). The three types of theories of universals are nominalism, conceptualism, and realism. Nominalism is the most restrictive of the three, because according to nominalism there are no universals that can be predicated of things other than the predicate expressions of language – where what it means to say that a predicate expression can be predicated of things is simply that the expression is *true of* those things (or that those things *satisfy* the expression). Hence, according to nominalism, there is no nexus of predication other than what occurs in language.

In conceptualism and realism there are universals other than the predicate expressions of language, and, at least in conceptualism and *logical realism*, it is these universals that provide the semantic grounds for the correct use of

predicate expressions—i.e., it is these universals that determine when a predicate expression is true (or false) of things. In conceptualism such universals are called *concepts*, whereas in realism they are generally called *properties* and *relations*. Concepts are what underlie predication in thought and language, which in conceptualism means that concepts cannot exist independently of the socio-biologically based capacity humans have for thought and language. The universals of realism, on the other hand, are what underlie predication in reality—e.g., the states of affairs that obtain in the world (as in *natural* realism), or the propositions that constitute the objective truths and falsehoods of the world (as in *logical* realism). These universals are assumed to exist independently of the human capacity for thought and language – and in logical realism (as a modern form of Platonism), unlike natural realism (as a modern form of Aristotelianism), they are assumed to exist independently of the causal structure of the world as well, and even independently of whether they are logically realizable or not.

In both nominalism and logical realism, the representation of ontological categories by the logico-grammatical categories of a theory of logical form is direct – although, as we explain below, the representation in logical realism is perhaps even more direct and simple than in nominalism. In conceptualism and natural realism, the situation is not so direct or simple as that. The properties and relations of natural realism, for example, are posited to account for the causal structure of the world; and, in that regard, they are not assumed to be the semantic grounds for the correct or incorrect application of predicate expressions except when those predicate expressions are explicitly assumed to represent such a natural property or relation – an assumption that can be made only *a posteriori*. Natural properties and relations are not the "meanings," or intensions, or cognitive capacities that underlie our use of predicate expressions; rather, they are what in the causal order may correspond to some, but by no means all, of the concepts we can form and the predicate expressions we can introduce in our use of language. We may use a predicate expression to represent a natural property or relation (and, in terms of that property or relation, a predication in reality, i.e., a state of affairs), but, in order to do so, the semantic grounds for the correct use of that expression must already be determined and explained in terms of some other theory of predication. In this regard, we maintain that in order for us to posit natural properties and relations in our scientific theories—and, therefore, in order for natural realism even to be formulable as a formal

ontology—it must be assumed that in principle natural realism is able to provide a natural, causal account of predication in both language and thought. If natural realism is to be a viable formal ontology at all, in other words, then in principle it must be able to provide the causal ground for one or another form of conceptualism—or, to be more precise, of one or another form of *conceptual natural realism* (see Cocchiarella 1989a, sections 13-14).

Conversely, conceptualism, as a socio-biologically based theory of the human capacity for thought and language, must in turn presuppose a causal ground for that capacity, and the most natural causal ground is an evolutionary theory based upon some applied form of natural realism. In addition, without some associated form of realism, natural or otherwise, conceptualism is at best only a truncated ontology, and it is dubious that it alone can provide an adequate account of the different modes or categories of being, including in particular (1) the states of affairs that obtain in the causal order, (2) the abstract objects that are normally assumed to exist in mathematics, and (3) the intensional objects that we seem to be committed to in our various theories and speculations about the world, whether true or false – which may well be the same as the intensional objects of fiction, or of stories in general, whether true or false.

Conceptual realism, as opposed to conceptualism *simpliciter*, does provide the general framework of a formal ontology that can accommodate both a natural realism and an intensional realism, as in *conceptual natural realism* and *conceptual Platonism*—or, instead of conceptual Platonism, as in *conceptual intensional realism*, where abstract objects are intensional objects that come about as products of cultural evolution. But the representation of the different ontological categories by logico-grammatical categories is not given in the direct and simple way in conceptual realism as it is in logical realism or nominalism. Instead, conceptual realism must represent the different formal modes of being in an indirect way. It is the explanation of this indirect way that is our primary concern in this essay.

2 Substitutional versus Ontological interpretations of Quantifiers

As a formal ontology, nominalism maintains the metaphysical thesis that being is a genus—which is not at all the same as to say that there cannot be different *kinds* of being. Traditionally, nominalism also maintained that whatever the different kinds of being there are, all are forms of concrete being—though, as recognized today, this does not seem to be necessary to nominalism as a formal ontology (see Goodman [1956]). The important point to notice here about nominalism as a formal ontology is that although there are different logico-grammatical categories (such as singular terms and predicates), there is nevertheless just one ontological category—namely the category of individuals or objects. In other words, the fact that predication unites expressions of different logico-grammatical categories does not mean that there must then be different ontological categories. The representation of ontological categories is not always quite as simple as that.

In nominalism, it is only the logico-grammatical category of singular terms that has ontological significance. This means that only objectual quantifiers—i.e., the first-order quantifiers that reach into the positions that singular terms occupy in the formulas (sentence-forms) of predicate logic—are indicative of nominalism's ontological commitments (see Goodman, *op. cit.*). It is for this reason that most contemporary nominalists restrict themselves to the theory of logical forms described in first-order predicate logic.

A formal ontology for nominalism need not preclude the introduction of predicate quantifiers, however. Rather, the point is that if predicate quantifiers are to be allowed at all in nominalism, then they must be interpreted only substitutionally, which means that the logic of predicate quantifiers must be restricted to what is now called standard "predicative" second-order logic (see Cocchiarella [1986], chapter one). Such a restriction involves imposing certain constraints on the logico-grammatical category of predicate expressions and how those expressions can be deductively transformed. In particular, in such a framework no formula (with n free variables) in which a predicate quantifier occurs can be taken as a proper/genuine substituend of the bound (n-place) predicate variables (or, in the case of standard ramified second-order logic, no formula in which there occurs a predicate quantifier of a ramified "level" higher than, or equal to, any given "level" can be a proper

substituend of the bound predicate variables of that "level").

A substitutional interpretation of quantifiers of any given type will not affect the general understanding that *to be* of a given ontological type (or category) of a formal ontology *is to be the value of a variable bound by a quantifier regarding that type*—i.e., a quantifier that can reach into positions in formulas occupied by expressions of the corresponding logico-grammatical type (or category). For a variable bound by a quantifier interpreted substitutionally will have no values at all but only substituends—i.e., expressions that can be properly substituted for that variable – and, in that regard, the logico-grammatical category represented by that variable (and its substituends) will have no ontological significance. But again, a substitutional interpretation, if it is not to be confused with an ontological interpretation, will bring with it certain important constraints regarding the logico-grammatical behavior of expressions of the category in question. It is in terms of those constraints that a formal ontology will distinguish a substitutional from an ontological interpretation.

Now it is significant that the constraints on the logic of predicate quantifiers in *constructive* conceptualism, as opposed to *holistic* conceptualism, are not unlike the constraints in nominalism. For unlike holistic conceptualism, constructive conceptualism does not allow for the formation of so-called "impredicative" concepts—i.e., concepts that can be represented only by a formula in which a predicate quantifier (of the same or higher "level" in the case of a ramified logic) occurs. In this regard, constructive conceptualism is also represented by a "predicative" second-order logic—but, because predicate quantifiers do have a referential or ontological significance in conceptualism, such a predicative logic is not the same as the predicative logic that represents the nexus of predication in nominalism. The difference between the standard predicative logic of nominalism and the "nonstandard" predicative logic of constructive conceptualism indicates that the distinction between an ontological and a substitutional interpretation of predicate quantifiers is somewhat more subtle than the different distinction between a "predicative" and an "impredicative" logic—because, although an impredicative logic clearly precludes a substitutional interpretation of predicate quantifiers, the same cannot be said for a predicative logic. (For more on the distinctions between constructive and holistic conceptualism on the one hand, and the "predicative" second-order logics of nominalism and constructive conceptualism on the other, see Cocchiarella [1986].)

3 The Importance of the Notion of Unsaturatedness in Formal Ontology

Predicate quantifiers have ontological significance in conceptualism because they are interpreted there as referring to concepts; but the sense in which they refer to concepts is not the same as (nor is it really even comparable to) the sense in which first-order, objectual quantifiers refer to objects. That is because concepts (as understood here) are not objects of any kind at all, but rather are unsaturated cognitive structures, which in the case of predicable concepts are based on cognitive capacities to identify, characterize and relate objects to one another in various ways. Referential concepts are cognitive capacities that are complementary to predicable concepts, and it is by their means that we are able to refer (or at least purport to refer) to objects in various ways. It is the exercise or realization in thought and speech of concepts as cognitive structures based upon such capacities that is what informs our speech acts, and our mental acts in general, with a predicable and referential nature, respectively. (For convenience, we ignore concepts other than predicable and referential concepts here.) Predicable concepts, for example, are based upon cognitive capacities that underlie our ability to follow the rules of language regarding the correct use of predicate expressions – and, in that regard, they are what determine the truth conditions that we associate with those expressions. Similarly, referential concepts are based upon the cognitive capacities that underlie our use of referential expressions (e.g., proper names, definite and indefinite descriptions, and quantifier phrases in general).

The terminology of unsaturatedness that we are using here is adopted from Frege, who also held that concepts have an unsaturated nature. Only, for Frege concepts are not cognitive capacities or mind-dependent entities at all. Rather, they are independently real functions from objects to truth values (the true and the false), which he also called properties and relations. These properties and relations are properties and relations in the logical sense, i.e., they are logically real properties and relations, because, as functions from objects to truth values, many of them have no instances (i.e., they assign the truth value the false to all objects), and, indeed, some are such that, logically, it is impossible for them to have any instances at all. The formal ontology that is associated with Frege's theory of logical form, accordingly, is a ver-

sion of logical realism. In addition, because all and only (saturated) objects are values of the individual variables, and all and only (unsaturated) functions are values of function variables, with (onto)logically different types of functions being the values of logico-grammatically different types of function variables, the different ontological categories of Frege's ontology are represented by expressions of different logico-grammatical categories. Here, we have a good example of a formal ontology in which ontological categories are represented in a direct and simple way through logico-grammatical categories, and where all and only the entities of any one ontological category are values of the variables bound by quantifiers respecting the corresponding logico-grammatical category.

The nexus of predication in Frege's formal ontology is explained in terms of what he took to be the unsaturated nature of functions, which means that in his version of logical realism the nexus of predication is really just a form of functionality. Such an interpretation is odd in a way because the only explanation Frege ever gave of the unsaturated nature of a function turned both on the unity of a sentence (which is based on the unsaturated nature of a predicate expression as a linguistic function) and the unity of the proposition (*Gedanke*) expressed by a sentence. Thus, in regard to the unsaturated nature of a predicate as the nexus of predication in a sentence, Frege claimed that "this unsaturatedness ... is necessary, since otherwise the parts [of the sentence] do not hold together" (Frege 1979, 177). Similarly, in regard to the unsaturated nature of the nexus of predication of a proposition (*Gedanke*), Frege argued that "not all parts of a thought [in the sense of an independently real proposition] can be complete; at least one must be 'unsaturated', or predicative; otherwise, they would not hold together" (Frege 1952, 54).

Bertrand Russell, whose original framework was also a version of logical realism (but not the same as Frege's—cf. Cocchiarella [1987], chapter 2), reversed the order of priority and explained functionality in general in terms of predication and the notion of a proposition. That is, a function, according to Russell, is really just a many-one relation, where it is the notion of a relation as the nexus of a predication, i.e., as a relating relation, that "embodies" the unity of a proposition. What holds the constituents of a proposition together, according to Russell, is a relation relating those constituents in a certain particular way, i.e. a relation as the nexus of a predication in reality.

Unfortunately, unlike Frege, Russell (at least until 1913) also took proper-

ties and relations to be objects, i.e. entities that could themselves be related by relations (of a higher-order/type) in the nexus of predication; and, in consequence, he was forced to reject the idea of properties and relations having an unsaturated nature. This led to certain difficulties in his theory of predication, and therefore in his formal ontology. In time, through being prodded by Wittgenstein (in 1913), he came to change his formal ontology from logical realism to logical atomism as a version of natural realism—though, in doing so he was no longer able to justify the ontological logicism that was his motive for originally adopting logical realism (see Cocchiarella [1987], chapter 5, for a detailed explanation of this last claim). It was Wittgenstein in the *Tractatus Logico-Philosophicus*—and Russell who later followed him in this—who replaced Frege's unsaturated logically real properties and relations (as functions from objects to truth values) with unsaturated natural (or "material") properties and relations as the modes of configuration or nexuses of predication in atomic facts or states of affairs. It is because of their unsaturated nature as modes of configuration or nexuses of predication, Wittgenstein came to see, that natural properties and relations cannot themselves be objects in such configurations.

It is not our purpose to describe or defend logical atomism here as a formal ontology—and, in fact, we do not think that it can succeed in fulfilling certain conditions of adequacy that any viable system of formal ontology must fulfill. We reject, in particular, the metaphysical notion of an ontologically simple object (which some regard as a bare particular) that is central to this ontology, as well as the thesis that all meaning and all analysis must ultimately be based upon such ontologically simple objects and the atomic states of affairs in which those objects are configured. Aside from requiring that all predicate expressions must be analyzable (and in that sense reducible) in strictly logical terms to the simple predicate expressions that stand for the natural properties and relations that are the modes of configuration of atomic states of affairs, such an analysis would also require (as in Rudolf Carnap's state descriptions) the semantic reduction of all quantifier expressions in favor of the simple proper names, or individual constants, that would occur in the atomic sentences of the formal ontology. All reference, in other words, is to be explained in logical atomism in terms of the singular reference involved in the use of such individual constants, which means that all mental acts of asserting or thinking a proposition must be analyzable in terms of the mental assertion of atomic propositions and the immanent, simple mental

objects that are their constituents (and that stand in a projective relation to the objects that they represent).

These consequences of logical atomism are rejected in both conceptualism and conceptual natural realism—where, in the latter framework, there are natural properties and relations but no ontologically simple objects such as are involved in logical atomism, and where it is false that all of the predicate expressions of language are assumed in principle to be logically analyzable in terms of the predicates that stand for natural properties and relations. Indeed, even without the assumption that there are any natural properties and relations at all, it is false in the kind of conceptualism we have in mind here that ultimately all reference must be explained in terms of the singular reference of proper names—or even in terms of the singular reference of proper names together with definite descriptions and other kinds of singular terms.

Conceptualism has an entirely different interpretation of the nexus of predication than is given in either Frege's logical realism or Wittgenstein's logical atomism—even though it too, like each of them, involves the notion of unsaturatedness in that explanation in a fundamental way. One important difference, for example, is that the primary unity of the categories that is achieved in conceptualism through the notion of unsaturatedness is the unity of thought as expressed in a mental act, which includes the unity of a speech act when a mental act is overtly expressed in language in a context of use. In Frege's logical realism, on the other hand, and in Wittgenstein's logical atomism (as a version of natural realism), the primary unity is the unity of a proposition or of an atomic state of affairs, respectively.

4 Referential and Predicable Concepts Versus Immanent Objects of Reference

Predicable concepts, we have said, are unsaturated cognitive capacities, or cognitive structures based upon such capacities, to identify, characterize, and relate objects to one another in various ways. Referential concepts are complementary capacities by which we are able to refer (or purport to refer) to such objects as well. It is the exercise or realization in thought and speech of concepts as cognitive capacities which is what informs our mental acts (which

include our speech acts) with a referential and a predicable nature. That is because as capacities to identify, characterize, and relate objects, as well as to refer to such objects, concepts are also the capacities that underlie our ability to follow the rules of language regarding the correct use of predicate and referential expressions. Indeed, unlike propositional knowledge—i.e., knowledge that certain propositions are true—our "knowledge" of the rules of language regarding the correct use of different kinds of expressions is really a matter of our having concepts in the sense of cognitive capacities, and our following those rules is really a matter of our exercising those concepts as capacities. It follows, accordingly, that concepts in the sense intended here do not exist independently of the more general capacity humans have for language and concept-formation—which does not mean that they are merely subjective entities and do not have a status as objective universals. Indeed, as intersubjectively realizable cognitive capacities, or cognitive structures based upon such capacities, that are common to different people, and that underlie the means by which people think and communicate with one another, concepts are objective entities—even if they are not "objective" in the sense of existing independently of the human capacity for thought and language, as is commonly assumed in logical realism (which, as in the case of Frege and Russell, identifies concepts with properties and relations).

Concepts, accordingly, are neither mental images nor ideas in the sense of particular mental occurrences—nor are they mental *objects* of any other kind as well (and hence they are not *object*-ive entities in that sense as well). Instead, as cognitive capacities that may in fact never be exercised, or that may be exercised at the same time by different people, or by the same people at different times—i.e., as intelligible or cognitive universals—concepts have an unsaturated nature. In addition, predicable concepts have an unsaturated nature that is complementary to the unsaturated nature of referential concepts. Indeed, it is because of the complementarity of predicable and referential concepts as unsaturated cognitive structures that we are able to make, e.g., a categorical judgment or statement, which is just the result of jointly exercising (and mutually saturating) a predicable and referential concept. As a mental act (which is overtly expressed in the case of a speech act), a categorical judgment or statement is an event, which means that it is an object of a special kind. But neither of the concepts that are realized—i.e., that are mutually saturated—in that event are themselves objects of any kind at all.

A general thesis of conceptualism regarding the complementarity of referential and predicable concepts is that every affirmative assertion (speech act) that is syntactically analyzable in terms of a noun phrase and a verb phrase (regardless of the complexity of either) is also semantically analyzable in terms of an overt application of a referential and a predicable concept, and that the assertion itself is the result of their mutual saturation in that joint application. It is in just this sort of joint application that we are to understand how conceptualism interprets the nexus of predication. A speech act in which 'All ravens are black' is asserted, for example, is the result of jointly applying the referential concept that 'all ravens' stands for—which, formally, can be represented by '$(\forall x Raven)$'—with the predicable concept that 'is black' stands for—which, formally, can be represented by '$Black(\ )$', or, using λ-abstracts (which are needed in any case to formally represent complex predicates), by '$[\lambda x Black(x)]$'. (We ignore the difference between singular and plural here, though we now believe that conceptualism is committed to giving some *logical* account of that difference, i.e., an account in terms of logical forms.) Thus, in conceptualism the logical form of the sentence 'All ravens are black' is given as '$(\forall x Raven) Black(x)$', or, equivalently, as '$(\forall x Raven)[\lambda x Black(x)](x)$'. The logical form of 'Some ravens are not black', which, assuming that the negation is internal to the predicate, we also view as an affirmative assertion, is given as '$(\exists x Raven)[\lambda x \neg Black(x)](x)$', where the internal negation (represented by '$\neg$') is now clearly part of the predicate expression.

Denials, or negative assertions, although equivalent in intensional content to an affirmative assertion in which the negation is internal to the predicate—as 'No raven is white' is equivalent in intensional content to 'Every raven is such that it is not white'—are not themselves affirmative assertions and should not be represented as such. The negative aspect of a denial such as 'No raven is white' is an external negation, which in this case can be represented as '$\neg(\exists x Raven) White(x)$'. In such a negative assertion, the referential concept that the quantifier expression that '$(\exists x Raven)$' stands for has been "deactivated," by which we mean that no referential act to a raven is involved in such an assertion. Such an act is involved in the equivalent affirmative assertion, but an equivalence of intensional content is not the same as an identity of cognitive structure, which is determined by the referential and predicable concepts (among possibly others as well) whose activation, or deactivation, is involved in the assertion in question.

Singular reference, as in the use of a proper name or a definite description, is not essentially different from a general reference, as in the use of 'some' and 'all' with a common name (and as in the use of such determiners as 'most', 'few', 'several', etc., with a common name as well—which we shall not go into here). Indeed, the category of *names* in conceptualism can be be taken to consist of *common names* and *proper names* as two distinct subcategories, where proper names and most common names are taken to stand for a sortal concept. Here, by a sortal, we understand a concept whose use in thought and communication is associated with certain identity criteria, i.e., criteria by which we are able to identify and count objects of the sort in question. Thus, just as the common name 'raven' stands for a sortal concept by which we are able to identify and refer to one or more ravens, so too a proper name such as 'Socrates' stands for a sortal concept by which we are able to identify and refer to a single individual. In general, the use of a proper name brings with it the identity criteria provided by the most specific common name sortal associated with that proper name.

Because singular reference is not essentially different from quantifier forms of reference, the referential use of a proper name in a conceptualist theory of logical form should also be represented by a quantifier phrase. In addition, because a proper name can be used both with and without an existential presupposition, it is appropriate that we use the same quantifiers $\exists$ and $\forall$ with proper names that are already used with common names. Thus, for example, we can use '$(\exists x Socrates)$' to represent a referential use of the proper name 'Socrates' that is with, as opposed to without, an existential presupposition, and, similarly, we can use '$(\forall x Socrates)$' to represent a referential use of 'Socrates' that is without such an existential presupposition. That both kinds of uses occur in thought and language is a well-known phenomena, which we shall not review and go into here. The important point here to note is that in both kinds of cases the referential concept is an unsaturated cognitive structure and not, for example, an "idea" as a mental occurrence, and certainly not a "bare particular" that is immanent to the mental act. The exercise of such a concept, or saturation of such a structure, together with a predicable concept results in a mental/speech act occurrence, and it is the functional roles of both concepts that informs that mental/speech act with a referential and predicable nature—but in neither case is the concept an object immanent to such a mental act. If by representationalism is meant the view that concepts are immanent objects of reference in our various mental

acts (as it is sometimes maintained in historical accounts of conceptualism), then conceptualism is not a form of representationalism. But then, perhaps this way of characterizing representationalism is both misleading and historically wrong—in which case there may be no incompatibility at all between conceptualism and representationalism after all.

Definite descriptions are also referential expressions that can be used both with and without existential presuppositions. An assertion of 'The King is wise', for example, as made by someone in a country (and at a time) in which there is a king, can be represented by '$(\exists_1 x King)Wise(x)$', where $\exists_1$ is a special quantifier representing a use of the determiner 'the' that is with, as opposed to without, an existential presupposition. The truth conditions of such an assertion in the kind of context indicated are essentially those described by Russell in his (1905) theory. That is,

$$(\exists_1 x King)Wise(x) \leftrightarrow (\exists x King)[(\forall y King)(y = x) \wedge Wise(x)]$$

is a valid thesis of the conceptualist theory of logical form in question here. But this is not to say that a representation of the truth conditions of a mental/speech act is the same as a representation of the cognitive structure of that act. Among other things, the latter should include, in particular, a representation of the referential and predicable concepts being exercised in that act, and that is not what a Russellian analysis of the truth conditions represents. (For more on this distinction, see Cocchiarella 1989b.)

For a use of the determiner 'the' that is without an existential presupposition, we need another special quantifier, $\forall_1$, that is dual to $\exists_1$. Given such a quantifier, we can take '$(\forall_1 x King)Wise(x)$' to represent an assertion of 'The King is Wise' in a context in which the definite description 'the King' is not being used with an existential presupposition regarding the existence of a (unique) king. The truth conditions of such an assertion can be similarly indicated by the following equivalence (as a valid thesis of conceptualism's theory of logical form):

$$(\forall_1 x King)Wise(x) \leftrightarrow (\forall x King)[(\forall y King)(y = x) \rightarrow Wise(x)].$$

These kinds of analyses can be applied to the well-known cases that are commonly brought up in the literature—such as Meinong's example of 'The round square is round and square', or, as in Descartes's version of the ontological argument, 'The perfect being is perfect'. (Contrary to what Meinong

maintained about definite descriptions in general, both of these sentences, assuming the reference is with existential presuppositions, will be analyzed as false, which is as it should be, regardless of what Meiong thought about the matter.) Here, 'the round square' can be rephrased (with 'round' as part of a relative clause) as 'the square that is round', which can be represented by '$(\exists_1 x Square/Round(x))$'. The truth conditions of such a relative clause can be unpacked through having

$$\begin{aligned}(\exists_1 x Square/Round(x))F(x) &\leftrightarrow (\exists x Square)[(\forall y Square)(Round(y)\\ &\leftrightarrow y = x) \wedge F(x)]\end{aligned}$$

as an instance of a general law for such clauses in definite descriptions. (For more details on the use of complex definite descriptions and non-sortal common names, such as 'being' in 'the being that is perfect', see Cocchiarella 1989b.)

There is no general presumption in any of these cases that that the exercise of a referential concept (i.e., the use of a concept by which we purport to refer) is always successful—i.e., that there always are entities that are the referents of our referential acts. This is particularly noteworthy in those cases of singular reference, such as the use of a proper name or a definite description, that are with, as opposed to without, existential presuppositions.

This last sort of observation was also made by Brentano, whose own ontology has striking similarities to conceptual natural realism (as a modern form of Aristotle's conceptual realism). Brentano noted, for example, that although "all mental references refer to things, ... in many cases, the things to which we refer do not exist" (1973, 291). This is not to say that such "things" have "being as objects", such as the intentional or "immanent objects" of Brentano's early work. Rather, according to Brentano, "all it means is that a mentally active subject is referring to them" (*ibid.*). The intentionality of a mental act consists, in other words, only in the activation or exercise of a referential concept as one of the determinants of that mental act, and not in the "being" of an object that is either immanent or transcendent to that act.

Brentano did not distinguish, as we have, between a concept as an unsaturated cognitive capacity and the event that is the result of exercising such a capacity in a mental act. His main concern was with what he called the mental content (*Inhalt*) of such an act, which in conceptualism corresponds to the referential aspect of the act, i.e., that aspect of the act that is "informed" by the exercise of a referential concept. Nor, we should note, did

Brentano allow in what has come to be called his reism, or concretism, any reference to objects other than concreta, i.e., objects that exist in the space-time causal manifold. In conceptual intensional realism (described in section 6 below), on the other hand, there can be reference to objects that do not (and, in fact, cannot) exist (as concreta in the space-time causal manifold). But then, even aside from such abstract objects, there can be reference in conceptualism in general to objects that could exist but which in fact do not exist (at the time of reference)—such as past or future objects, and perhaps also merely causally possible objects, such as the oak tree that a now destroyed acorn could have grown into (as a matter of natural possibility). In other words, regardless of whether there are abstract intensional objects or not, concrete existence, according to conceptualism, is not the same as *being*, which is a concept that past and future objects fall under even if they do not now exist, and which perhaps even merely causally possible objects fall under as well (depending on our view of causal possibility as an ontological mode of being). (See Cocchiarella 1989a, section 12, for more on the distinction between existence and being in conceptualism.)

The distinction between being and (concrete) existence is not a material but a formal distinction in conceptualism. It corresponds, in particular, at least on the level of objects, to the difference between a use of the quantifier phrase, 'there be (is, are)', and a use of the related, but different, quantifier phrase, 'there exist(s)', which in a conceptualist theory of logical form can be represented by the logico-grammatical difference between $\exists$ and $\exists^e$ as quantifiers (or perhaps $\exists^a$ instead of $\exists^e$ to emphasize that it is existence in the sense of actual/concrete being that is in question). Being and (concrete/actual) existence, in other words, are formal, "logical" concepts according to conceptualism, and not properties, or attributes, that things might or might not have. Thus, whereas *to be* (an object) is to be a value of an individual variable bound by $\exists$, *to exist* (as an object in the space-time causal manifold) is to be a value of an individual variable bound by $\exists^e$, which, formally, can be defined as follows:

$$E!(x) =_{df} (\exists^e y)(x = y).^1$$

[1]The absolute quantifier '$(\exists^e y)$' abbreviates '$(\exists^e y Object)$', where the non-sortal common name 'Object' is taken as the common name that is the ultimate superordinate of all common names. As discussed in Cocchiarella (1989b), we leave open whether such an ultimate superordinate is a new primitive notion or is contextually defined in terms of

In the framework of conceptualism, accordingly, there is such a concept as (concrete) existence—which is not the same as to say that there is a property, or attribute, of existence in the sense of either logical or natural realism. It is the latter thesis that Brentano was particularly concerned to deny, we maintain, and not the former. (See, e.g., Brentano 1973, 208). Thus, to say that Socrates exists is not to ascribe an attribute, or property, of existence, to Socrates, any more than to say that Pegasus does not exist is to ascribe an attribute, or property, of nonexistence to Pegasus. All we do in both cases, according to Brentano, is either affirm or deny "the object" in question—by which he means only that we affirm or deny "the object" as a mental content (or "immanent objectivity") through which the intentional act of reference is made. In conceptualism, as already noted, this mental content corresponds to that aspect of an assertion that is "informed" by the application, or activation, of a referential concept, which, as an unsaturated cognitive structure, is not in any sense an object immanent to the act of reference.

This suggests that Brentano's view of what it means to say that Socrates exists, or that Pegasus does not exist, can be reconstructed (or represented) in conceptualism in terms of the logical forms '$(\exists x Socrates)E!(x)$' and '$\neg(\exists x Pegasus)E!(x)$', respectively. Here, in the denial of existence in particular, where the referential concept is deactivated, there is no need to speak of "objects" that do not exist as objects that are immanent to our mental acts. Nor is there any need to speak, as Meinong does, of the being of *Nichtseinsobjektiven*, or states of affairs, having nonexistent objects as components – a position that Brentano rejected very emphatically (*op. cit.*, 292).

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quantification over sortal concepts as follows:

$$(\forall x Object)\phi =_{df} (\forall S)(\forall x\ S)\phi,$$
$$(\exists x Object)\phi =_{df} (\exists S)(\exists x\ S)\phi,$$

and similarly for '$(\forall^e x Object)\phi$' and '$(\exists^e x Object)\phi$'. Thus, to refer to every object, on this analysis, is to refer to every object *of whatever sort*, and to refer to some object is to refer to some object *of some sort or other*.

5 Conceptual Natural Realism and the Analogy of Being Between Natural and Intelligible Universals

Conceptualism, without any associated form of realism, is at best only a truncated ontology. Yet, as a socio-biologically based theory of the generic capacity humans have for language and thought, it would seem that conceptualism must presuppose some form of natural realism as the causal ground of that capacity. Conversely, natural realism, it would seem, cannot stand on its own, but must, in turn, presuppose some form of conceptualism by which to explain how it is possible for us to form concepts and use language in our various theories and descriptions of the world, including in particular our ability to posit natural properties and relations as part of the causal order. There is a natural affinity between conceptualism and natural realism, we maintain, in that each seems to presuppose the other as part of a more general, supporting framework, which we shall call *conceptual natural realism.*

Concepts, we have said, do not exist independently of the capacity humans have for language and thought, whereas natural properties and relations do. Unlike the properties and relations assumed in logical realism, however, natural properties and relations are not assumed to exist independently of the causal structure of the world, and in particular they are not assumed to exist independently of the causal possibility of their being realized, i.e., of the causal possibility for there to be (concrete) objects having those properties and relations. The important point for us here at the moment, however, is not the difference between the properties and relations of natural realism and those of logical realism, but the difference between concepts and natural properties or relations. This is no less true even in those cases in which a natural property or relation may correspond to a concept, i.e. in which, properly speaking, a concept may be said to represent a natural property or relation.

The historical antecedents of conceptual natural realism seem to have been confused on just this point. Peter Abelard, for example, in his *Glosses on Porphyry*, does not distinguish the predicable concepts we exercise in thought from the universals (in the sense of a moderate realism) that exist as a common likeness in things. That is, a universal, according to Abelard,

seems to "exist" in a double way, first as a common likeness in things (prior to, and independent of, our having any concepts regarding that likeness), and then as a predicable concept in the human intellect through our capacity to abstract the likeness in things from our perception of them. Here, it is clear that the properties and relations in question exist only in the causal or natural order as likenesses in things—and yet, were those things to cease to exist, according to Abelard, they would still somehow exist in the human intellect as a universal concept.

Aristotle also seems to describe the natural kinds and properties of his conceptual natural realism in this double way, i.e., as having a mode of being both in things and, through an inductive abstraction (*epagoge*), in the human mind (*nous*) as well—though it is possible to interpret him otherwise. The point, in any case, is that when conceptualism is combined with natural realism, we must be careful not to confuse concepts with natural properties and relations, but at best to speak only of there being a correspondence between some predicable concepts and some natural properties and relations—a correspondence in which such a concept may be said to represent the corresponding natural property or relation.

One reason why the universals of natural realism were confused with predicable concepts (as universals that exist only in the intellect) is that both can be designated by predicates—or, more precisely, that a predicate that stands for a concept for which it is assumed there is a corresponding natural property or relation can also be taken (in a secondary, or derived, sense) to stand for the corresponding natural property or relation. A predicate can be taken to stand for a natural property or relation, in other words, as well as for a concept—even though the sense in which it stands for the former is derived from, and secondary to, the sense in which it stands for the latter. The sense in which a predicate stands for a concept is primary because it is the concept that determines the functional role of the predicate and the conditions under which it can be correctly used. It is only by assuming that there is a natural property or relation that corresponds to the truth conditions determined by the concept—a natural property or relation that may in fact be the causal basis for our construction of the concept—that we then can say, in a secondary sense, that the predicate also stands for a natural property or relation. Thus, even though the natural property or relation is prior in the order of being, nevertheless, the concept that the predicate stands for is prior in the order of conception.

The distinction between concepts in the order of conception and natural properties and relations in the order of being does not mean that there should also be a distinction in the theory of logical form of conceptual natural realism between predicates that stand for concepts and predicates that stand for a natural property or relation. The same predicate may be taken to stand in a double way both for a concept (in the primary sense) and a natural property or relation (in the secondary sense). Thus, it is not that the same universal can exist in a double way, as Abelard assumed, first in nature and then in the mind, but rather that, semantically, the same predicate can stand in a double way both for a concept and a natural property or relation—though it stands first for a concept, and then derivatively, and only in the sense of an empirical hypothesis, for a natural universal in nature as well.

Similarly, just as a predicate constant can be taken to stand in double way both for a concept and a natural property or relation, so too an (n-place) predicate variable can be taken in a double way to have both (n-ary) concepts and (n-ary) natural properties and relations as its values. The difference between the universals in the one order and the universals in the other is reflected not in a difference between two "types" of predicate constants and variables—where the one "type" stands for concepts and the other stands for natural properties and relations—but in the kind of second-order reference that is made by means of predicate quantifiers, i.e., the quantifiers that can be affixed to predicate variables and that determine the conditions under which a predicate constant can be substituted for a predicate variable so bound. In this way, the difference is reflected not in a difference of "types" of predicate variables to which predicate quantifiers can be affixed, but in a difference between the predicate quantifiers themselves.

What we need to add to the second-order conceptualist theory of logical forms already briefly indicated, accordingly, are special quantifiers, $\forall^n$ and $\exists^n$, that can be applied to predicate variables, and that, when so applied, can be used to refer to natural properties and relations. Thus, for example, the fundamental thesis, (NR), of natural realism that every (j-ary) natural universal is causally realizable can be stated in terms of such a quantifier as follows:

$$(\forall^n F^j)\Diamond^c(\exists^e x_1)...(\exists^e x_j)F(x_1, ..., x_j). \qquad \text{(NR)}$$

Here, the modal operator $\Diamond^c$ represents only a causal (or natural) possibility, and not a logical or merely conceivable possibility. With the modal operator

deleted, the thesis (NR) can be taken to represent a form of Aristotle's moderate realism, in which it is assumed that properties and relations exist only *in re*, i.e., only in the concrete objects that have those properties and relations. With the modal operator for causal possibility (in the sense of what is possible in nature), (NR) represents a *modal moderate realism* according to which natural properties and relations have a mode of being within the causal structure of the world, and in particular a mode of being that does not depend on whether or not there are objects having those properties and relations—and therefore a mode of being that is in that sense *ante rem*—but not a mode of being that is independent even of whether or not there could be (in the sense of a natural possibility) objects having such properties and relations. When the universe was first formed, there were only elementary particles and no atoms of any kind—or at least certainly not atoms or compounds of any complex kind. Many of the natural properties and relations that we assume to now structurally characterize atoms and compounds as complexes did not at that time characterize any objects at all—which does not mean that they did not have any real mode of being within nature's causal matrix. Indeed, there may well yet be some transuranic substances, and natural properties of such, that will, as a matter of contingent fact, never be realized in nature by any objects whatsoever, but which, nevertheless, as a matter of a natural or causal possibility, could be realized. The being of such a natural property or relation does not consist of its being a characteristic of some object at some time or other, i.e., its being *in re*, but rather the causal possibility of its being *in re*—a possibility that can be accounted for only by that property or relation having a mode of being as such within the causal structure of the world. That is why conceptual natural realism rejects Aristotle's moderate realism and replaces it with a modal moderate realism as formulated in (NR).

The fact that only concrete objects can have a natural property or relation is reflected in the following additional law of conceptual natural realism:

$$(\forall^n F^j)[F(x_1, ..., x_j) \rightarrow E!(x_1) \wedge ... \wedge E!(x_j)],$$

where, as already indicated, we use $E!$ to stand for the formal concept of (concrete) existence (in the causal space-time manifold).

The assumption that there is a natural property or relation corresponding to the (j-*ary*) concept that a given (j-place) predicate constant or (open)

formula $\phi(x_1, ..., x_j)$ stands for—i.e., the assumption that such a predicate expression stands (in the secondary sense) for a (*j-ary*) natural universal—can be formulated as follows:

$$(\exists^n F^j)\Box^c(\forall x_1)...(\forall x_j)[F(x_1, ..., x_j) \leftrightarrow \phi(x_1, ..., x_j)].$$

A natural property or relation can be completely specified in this way, it should be noted, because, unlike concepts, natural properties and relations are "identical" when, as matter of causal necessity, they are coextensive. As part of the causal structure of the world, in other words, natural properties and relations retain their "identity" as such across all causally accessible worlds. Formally, we can express such a cross-world causal "identity" of universals as follows:

$$F^j \equiv_c G^j =_{df} \Box^c(\forall x_1)...(\forall x_j)[F(x_1, ..., x_j) \leftrightarrow G(x_1, ..., x_j)].$$

Thus, using λ-abstracts for the specification of complex concepts, the above way of stipulating that there is a natural property or relation corresponding to a given (*j-ary*) concept $[\lambda x_1...x_j\phi]$ can be more succinctly stated as follows:

$$(\exists^n F^j)\,([\lambda x_1...x_j\phi] \equiv_c F)\,.$$

Here, it is important to note that, unlike the comprehension principle of logical realism, such an assumption is at best only a scientific hypothesis, and as such must in principle be subject to confirmation or falsification.

Natural properties and relations are not intensional objects, it should be noted, nor are they *objects* of any other kind as well. Indeed, natural properties and relations, as universals that might have no concrete instances in the world at all, are not contained within the space-time causal manifold the way that concrete objects are, but rather are *unsaturated* causally determinate structures within that manifold. In this regard, natural properties and relations have a mode of being other than that of concrete objects—a mode of being that, in fact, is analogous to (though not the same as) the unsaturated mode of being of predicable concepts. Thus, although the unsaturated mode of being of natural properties and relations is not the same as that of predicable concepts, nevertheless they are said to "be" in a sense analogous to the way that concepts are said to be—namely, as values of bound predicate variables (albeit bound by $\forall^n$ and $\exists^n$, instead of $\forall$ and $\exists$). In addition,

just as predicable concepts are said not to exist independently of the general capacity humans have for language and concept-formation, so too natural properties and relations are said not to exist independently of nature and its causal matrix. That is why, just as the laws of compositionality for concept-formation can be said to characterize the logical structure of the intellect as the basis of the human capacity for language and thought, so too the laws of nature regarding the causal connections between natural properties and relations (especially as structural aspects of natural kinds) can be said to characterize the causal structure of the world. (See Cocchiarella 1989a for more on this issue.)

6 Conceptual Natural Realism and Aristotelian Essentialism

In addition to the natural properties and relations that may correspond to some, but not all, of our predicable concepts, there are also natural kinds that may correspond to some, but not all, of our sortal concepts. By a natural kind we understand here a type of causal structure, or mechanism in nature, that is the basis of the powers or capacities to act, behave, function, etc., in certain determinate ways that objects belonging to that natural kind have. Indeed, according to Aristotelian essentialism, natural kinds are the causal structures, or mechanisms in nature, that determine the natural laws regarding the different natural kinds of objects that there are, or can be, in the world.

The question of to which of our sortal concepts there corresponds a natural kind is, as in the case of the correspondence of natural properties and relations to certain of our predicable concepts, an empirical matter that is always subject to confirmation or falsification. The assumptions we make regarding such correspondences are hypotheses of scientific theories and are never validated on logical grounds alone, i.e., in terms of a theory of logical form for conceptual natural realism.

It is possible to construe natural kinds (as I have done in Cocchiarella 1989a) as natural properties, albeit subject to special laws that do not apply to natural properties in general. I now think, however, that it is more appropriate to see a difference of ontological type, or category, between nat-

ural kinds and natural properties—a difference that should be reflected in the theory of logical form for conceptual natural realism. This ontological difference corresponds in fact to the conceptual difference between sortal (common name) concepts and predicable concepts and the way that referential concepts based on the former may be saturated in thought by the latter. Thus, just as a (one-place) predicate may stand in a double way for both a concept and a natural property, so too a sortal common name may stand in a double way for both a sortal concept and a natural kind. Similarly, just as the quantifiers $\forall^n$ and $\exists^n$ can be applied to predicate variables, whereby we are able to refer to natural properties and relations, so too additional quantifiers, e.g., $\forall^k$ and $\exists^k$, can be introduced and applied to common name (sortal) variables, whereby we are able to refer to natural kinds. Similarly, just as a referential concept based upon a sortal concept can be saturated by a predicable concept in a judgment as a mental act, so too the natural kind corresponding to a sortal concept may be thought of as an unsaturated causal structure, which, when realized by an object belonging to that natural kind, can be saturated by a natural property or relation in a state of affairs having that object as a constituent. In this regard, a natural kind is not a "conjunction" of natural properties and relations that objects belonging to that natural kind have, but rather is the causal ground or nexus of each of the states of affairs corresponding to such a conjunction. (The rejection of natural kinds as "conjunctive" properties is typical of the way Aristotelian essentialism has been misrepresented.)

Even though natural kinds are not themselves properties, the thesis of natural realism that every natural property or relation is causally realizable applies to natural kinds as well. This thesis can be formulated as follows:

$$(\forall^k S)\Diamond^c(\exists^e x)(\exists y S)(x = y). \qquad \text{(K1)}$$

Here, we should note that the expression '$(\exists y S)(x = y)$' says, in effect, that 'x is (identical with) an S', so that the thesis can be read as asserting of every natural kind S that it is causally possible for there to exist an object x that is an S. For convenience, we can symbolize 'x is an S' more simply as 'xS' by adopting the following definition:

$$xS =_{df} (\exists y S)(x = y).$$

The quantifier phrase '$(\exists^e x)$' ('there exists') in (K1) can be replaced by the more general phrase '$(\exists x)$' ('there is'), incidentally, because we assume that

only (concrete) existents (i.e., values of variables bound by $\exists^e$) belong to natural kinds; that is, because

$$(\forall^k S)(\forall x)[x\ S \rightarrow E!(x)] \tag{K2}$$

is assumed to be a valid thesis of this version of Aristotelian essentialism.

The most fundamental law of natural kinds as (natural) "essences" is that an object can belong to a natural kind only if being of that natural kind is essential to it—i.e., only if it *must* belong to that natural kind whenever it exists:

$$(\forall^k S)(\forall x)\,(xS \rightarrow \Box^c[E!(x) \rightarrow xS])\,. \tag{K3}$$

If we adopt the following abbreviatory notation for common names,

$$\begin{aligned} S_1 &\leq S_2 =_{df} \Box^c(\forall x)[xS_1 \rightarrow xS_2], \\ S_1 &< S_2 =_{df} (S_1 \leq S_2) \wedge \neg(S_2 \leq S_1), \end{aligned}$$

then *the partition principle* for natural kinds can be stated as follows:

$$(\forall^k S_1)(\forall^k S_2)\,(\Diamond^c(\exists x)[xS_1 \wedge xS_2] \rightarrow S_1 \leq S_2 \vee S_2 \leq S_1)\,. \tag{K4}$$

If two natural kinds are not necessarily disjoint, then, according to (K4), one must be subordinate to the other. Thus, the family of natural kinds to which any object may belong forms a chain of subordination of one natural kind to another—where each natural kind in the chain is, as it were, a template structure that is causally more determinate and finer-grained than the natural kinds to which it is subordinate.

An important consequence of (K3) and (K4) is the thesis that an object can be of two natural kinds only if, as a matter of a natural or causal necessity, it belongs to the one kind when and only when it belongs to the other:

$$(\forall^k S_1)(\forall^k S_2)(\forall x)\,(\Diamond^c(xS_1) \wedge \Diamond^c(xS_2) \rightarrow \Box^c[xS_1 \leftrightarrow xS_2])\,.$$

In terms of this view of natural kinds as template causal structures that can fit one within another, it is only natural to assume a *summum genus principle* to the effect that any chain of subordination between natural kinds must have a summum genus as an ultimate, initial template structure within which all of the natural kinds of that chain must fit. It is only in this way that the individuation of natural kinds of objects can even begin to take

place in the universe as an ontological process. Formally, the thesis can be stated as follows:

$$(\forall^k S_1)(\forall x)\left(xS_1 \rightarrow (\exists^k S_2)[xS_2 \wedge (\forall^k S_3)(xS_3 \rightarrow S_3 \leq S_2)]\right). \qquad \text{(K5)}$$

Thus, any object that belongs to a natural kind belongs, according to this thesis, to a natural kind that is a summum genus—that is, a natural kind that has subordinate to it every natural kind to which that object belongs. Given the partition principle, (K4), (K5) is equivalent to the following alternative way of stating the summum genus principle—namely, that every natural kind is subordinate to a natural kind that is properly subordinate to no other natural kind:

$$(\forall^k S_1)(\exists^k S_2)[S_1 \leq S_2 \wedge \neg(\exists^k S_3)(S_2 < S_3)].$$

The dual of a summum genus as the ultimate, initial causal template structure of a natural kind of object is the infima species of that object. This is the finest grained template structure determining the causal nature of that object. The *infima species principle* stipulates, accordingly, that if an object belongs to a natural kind, then it belongs to a natural kind that is subordinate to all of the natural kinds to which that object belongs:

$$(\forall^k S_1)(\forall x)\left(xS_1 \rightarrow (\exists^k S_2)[xS_2 \wedge (\forall S_3)(xS_3 \rightarrow S_2 \leq S_3)]\right). \qquad \text{(K6)}$$

A consequence of (K6) is the following alternative version of the infima species principle—namely, that every natural kind has subordinate to it a natural kind to which no other natural kind is subordinate:

$$(\forall^k S_1)(\exists^k S_2)[S_2 \leq S_1 \wedge \neg(\exists^k S_3)(S_3 < S_2)].$$

There are other theses of Aristotelian essentialism that we could mention here as well—such as that every genus is the sum of its species, or that all of the natural kinds that are immediate species of a genus are either the "same" species of that genus or are necessarily disjoint, etc.—but these are matters that we shall not go into here. (See Cocchiarella 1989a, section 14, for a discussion of such additional theses.)

7 Conceptual Intensional Realism versus Conceptual Platonism and the Logic of Nominalized Predicates

We have explained in the last two sections how the theory of predication of a truncated ontology such as conceptualism can be analogically developed into a realistic Aristotelian ontology (which we have called conceptual natural realism) that can account for various ontological categories or modes of being in the natural world of the space-time causal manifold. (An indication of how the categories of time and space are constructed in conceptualism in terms of tense operators of both the local time determined by a continuant and the cosmic time based on the signal relation of a causal network of continuants can be found in Cocchiarella 1984, sections 13–15.) It is no less significant that such a theory of predication can also be developed into a Platonist or intensional ontology of abstract objects, including in particular the abstract objects of number theory and the intensional objects of fiction.

The fundamental insight into the nature of abstract *objects*, according to conceptualism, is that we are able to intellectually grasp and have knowledge of them only as the correlates of concepts. Historically, this correlation has come about through the development and institutionalization of the rule-based linguistic process of nominalization, which, conceptually, represents a kind of reflexive abstraction in which we attempt to represent what is not an object—e.g., an unsaturated cognitive structure underlying our use of a predicate expression—as if it were an object. In predicate-nominalization, for example, a predicate phrase (such as 'is triangular', 'is wise', 'is just', etc.) becomes transformed into an abstract singular term (such as 'triangularity', 'wisdom', 'justice', etc.), by which we purport to denote an abstract object as the intensional content of the concept that is expressed by that phrase. It was Plato who first recognized the ontological significance of such a transformation and who built his ontology around it.

Formally—i.e., within our conceptualist theory of logical form—we can represent the nominalization of a predicate expression of the form '$F(\ )$' by simply deleting the parentheses (and commas in the case of a relational predicate) that are part of the functional role of that expression as a predicate. As a complex predicate expression, a λ-abstract, '$[\lambda x_1 ... x_n \phi](\ )$', can be similarly nominalized, resulting in '$[\lambda x_1 ... x_n \phi]$' as an abstract singular term.

(Frequently, for brevity, we use 'F' and '$[\lambda x_1 ... x_n \phi]$' without parentheses and commas to refer to the predicate expressions themselves as well—but the parentheses and commas are always present when these expressions are actually being used as predicates.) Thus, where 'F' is a one-place predicate, we now have not only '$F(x)$' but also '$F(F)$' as a well-formed formula.

There are forms of conceptualism that reject the hypostatization of abstract objects as concept-correlates. Abelard, for example, who, for reasons already indicated, might well be interpreted as a conceptual natural realist, acknowledged that the same (conceptual/natural) universal might well be shared by different objects—the way Socrates and Plato shared the universal of being human—but he rejected the idea that such a universal could itself be a "thing", i.e., an object. In our present context, where predicate variables represent both the category of concepts and the category of natural properties and relations as unsaturated universals, and the individual variables 'x', 'y', etc. represent the category of objects, we can represent the Abelardian thesis as

$$(\forall F^j)\neg(\exists x)(F = x), \qquad \text{(Abelard}^*\text{)}$$

and

$$(\forall^n F^j)\neg(\exists x)(F = x), \qquad \text{(Abelard}^*_n\text{)}$$

where the first applies to concepts, and the second to natural properties and relations, as unsaturated universals. Here, for example, although the initial quantifier of (Abelard*) refers to an arbitrary (j-ary) concept, the nominalized occurrence of the predicate variable in the embedded identity formula purports, as an abstract singular term, to denote an abstract object as the correlate of that concept. What the Abelardian thesis maintains is that any such "purporting" to denote by a nominalized predicate can never succeed—i.e., that every such abstract singular term must be denotationless. (For more on the Abelardian thesis, see Cocchiarella 1986, chapter 4.)

The Platonist—or, more properly, the conceptual Platonist—takes the opposite position, namely, that every nominalized predicate, as an abstract singular term, denotes an abstract object—and, in particular, that the object it denotes is the real intensional content of the concept that the predicate otherwise stands for in its role as a predicate. Formally, the Platonist thesis can be stated as follows:

$$(\forall F^j)(\exists x)(F = x). \qquad \text{(Plato}^*\text{)}$$

Note, however, that because of the unsaturated nature of concepts, any (*j-ary*) concept that the initial predicate quantifier refers to cannot itself be the object purportedly denoted by the nominalized predicate that occurs in the identity formula that follows. That is why we speak of the object denoted as the correlate of the concept, or simply as a concept-correlate, by which we mean an "*object*-ified" reification of the intension of the concept, or, equivalently, a reified "*object*-ification" of the truth-conditions determined by the concept. Thus, by starting out from concepts as (unsaturated) cognitive capacities underlying our use of language, we are able to grasp the intensions of our concepts as abstract objects by means of a reflexive abstraction corresponding to the process of nominalization.

Now it is noteworthy that the abstract objects that nominalized predicates are assumed to denote are also usually called properties and relations—a usage that, unfortunately, has led to a conflation of these entities with the unsaturated properties and relations of natural realism. This in turn has led to an inappropriate opposition between conceptual natural realism and conceptual Platonism, which, historically, has been represented by the opposition between Platonism and Aristotelianism. There need be no such opposition in *conceptual realism*, however, by which we now mean not just conceptual natural realism but conceptual natural realism together with a conceptual Platonism—or, preferably, with the alternative conceptual intensional realism described below. For, just as it is only concepts as unsaturated cognitive capacities that are the basis of predication in thought, it is only the analogically projected unsaturated natural properties and relations of natural realism that are the basis of predication in the states of affairs that obtain in nature. As abstract *objects*, properties and relations in the Platonic sense are really not (unsaturated) predicable entities at all—which is not to say that they do not reflect in the intensional order some of the aspects of predication in thought or reality, including in particular their role as constituents of propositions, which in turn are the abstract objects that nominalized sentences denote as abstract singular terms.

The way intensional objects (e.g., properties in the Platonic sense) mimic the role of concepts can be seen in the following analysis of exemplification, which clearly indicates the conceptual priority of predication over exemplification:

$$x \ \in \ y =_{df} (\exists F)[y = F \wedge F(x)].$$

In strictly extensional contexts—i.e., applications of conceptual realism in which an extensionality axiom for nominalized predicates is assumed—this definition can also be taken as an analysis of membership in a class in the logical sense (i.e., as the extension of a concept). That is, in strictly extensional contexts, the intension of a concept can be taken as the extension of that concept, so that just as we are able to apprehend the intension of a concept by starting out from the concept, so too are we able to apprehend the extension of a concept by starting out from the concept. In this way the well-known construction of numbers and other mathematical entities in terms of classes as extensions can also be given in terms of the concept-correlates of conceptual realism. (See Cocchiarella 1992 for more on how certain well-known foundational theories of membership in a class can be contained in conceptual realism.)

Despite the prevalence today of having only a theory of membership as a foundation for mathematics, it is important to emphasize that it is predication and not membership that is primary and fundamental in the analysis of numbers and other mathematical objects. This is not only because any representation of membership (and exemplification) will presuppose a superseding theory of predication, but also because, as a result of Russell's paradox, not all concepts can be "object-ified", i.e., reified as objects, and therefore not all concepts will have an extension or intension as a concept-correlate. A theory of membership (or exemplification), in other words, can give at best only a limited and imperfect reflection in the intensional order of the role of concepts in the nexus of predication of the order of thought, and in that regard it cannot be taken as a foundation for mathematics that can stand on it own as an alternative to predication. It is only by understanding how predication in thought and language is possible at all that we can begin to explain how membership in a class, and, similarly, how exemplification of a property (in the Platonic sense), are ultimately to be understood and given a foundation of their own. (See Cocchiarella 1989b, section 3, for more on the significance of Russell's paradox in conceptualism.)

Whether viewed as intensions or extensions, all abstract objects, according to conceptual realism, are concept-correlates, which means that they have their being, at least in an epistemological sense, in the concepts whose correlates they are. Thus, even though abstract objects may be assumed, as they are in conceptual Platonism, to "exist" in a realm that transcends space, time and causality—and therefore "preexist" the evolution of consciousness and

the cognitive capacities we exercise in thought and language—nevertheless, from an epistemological point of view, no abstract object is assumed to "exist" as an object of reference otherwise than as the correlate of a concept.[2] It is only in this way that we can explain how, by starting out from concepts as cognitive capacities, we can have knowledge of abstract objects, be they Platonic forms (i.e., properties or relations in the Platonic sense), or classes in the logical sense (i.e., classes as extensions of concepts), among either of which we can include the abstract objects of mathematics.

Conceptual Platonism is not the only way in which abstract objects may be assumed to "exist", however; and, in fact, there is a form of conceptual intensional realism in which the Platonist assumption that abstract objects "exist" outside of space, time, and causality, and therefore "preexist" the evolution of consciousness, is rejected. The being of all abstract objects, i.e., all concept-correlates, on this view, is to be explained in terms of the evolution of language and culture. It is not only that our knowledge and grasp of abstract objects depends upon their being concept-correlates, but even the nature of their being as abstract objects is understood, on this view, to consist entirely of their being concept-correlates. Abstract objects have a dependent, or relational, mode of being, in other words, because their role as concept-correlates is essential to their being understood as objects of thought at all.

All abstract objects, on this view, are products of language and culture, and, despite the fact that they have a certain degree of autonomy, they do not have any being of their own independently of the role they play in language and culture.[3] On this view, it is not only our grasp and knowledge

[2]We place scare-quotes around 'exists' here so as distinguish the being of abstract objects from that of concrete objects. Both kinds of objects are individuals, and, as such, have being as values of the individual variables bound by the objectual quantifier, 'there *be*', which we have represented by '$(\exists x)$'. Only concrete objects are "actual" or exist in the sense of being values of the individual variables bound by the objectual quantifier, 'there exists', on the other hand, which we have represented by '$(\exists^e x)$'.

[3]See Popper and Eccles 1977, chapter P2, for a description of a related view of abstract objects. Intensional objects, according to Popper and Eccles, belong to what they call World 3, as distinct from World 1, which is the universe of physical entities, and World 2, which is the world of mental states, both conscious and unconscious. This terminology of different worlds is adopted from Frege, who, unlike Popper and Eccles, thought of World 3 as independent of the space-time causal manifold of World 1.

It should be perhaps be noted here that although conceptual realism is compatible with,

of intensional objects that has come about primarily through the development and use in language of the process of nominalization, i.e., the process whereby predicates and other expressions are transformed into abstract singular terms, but even the very abstract being of those objects as well. It is the evolution of this process of nominalization, which began with the first rudimentary attempts to reflexively abstract the intensional content of our concepts—i.e., to reify, or "*object*-ify", the rule-based cognitive capacities that underlie our use of language—that is the ultimate, explanatory ground of the mode of being of abstract objects. It is only through the evolution and institutionalization of this process that humanity has been able to grasp and talk about abstract objects at all, and, because such a process is essential to our knowledge of such objects, it is only in their status as products of cultural evolution, i.e., as concept-correlates, that their being as abstract objects is ultimately to be explained.

Abstract objects are not only products of cultural evolution, but are themselves the means by which the further evolution of culture is possible. For in addition to the abstract objects of mathematics, which are essential to the development of science and technology, there are also propositions as the intensional objects that nominalized sentences denote in their role as abstract singular terms. A standard form of such a nominalized sentence is a *that*-clause, such as occurs in statements expressing a propositional attitude—e.g., a statement of belief, which has the form 'x believes that ϕ', or a statement of desire, which has the form 'x desires that ϕ', etc.

As objects in the intensional order, propositions are not the same as states of affairs, which are part of the causal order of the natural world. Nevertheless, as intensional objects, propositions enable us to construct a "bracketed world" of intensional content within which we are able to freely speculate and construct various hypotheses and theories about the natural world. Whether true or false, all theories about the natural world consist of a system of propositions, which we are able to contemplate independently of whether or not there are any states of affairs in the natural world corresponding to them. In this way, as intensional objects, propositions serve to

and may even be taken to support, the Popper-Eccles interactionist theory of mind, nevertheless, it does not presuppose that theory. Indeed, conceptual realism is also compatible with the view that World 2 is a part of World 1, and may be further divided into a variant in which (a) World 2 is reducible to the strictly physico-chemical part of World 1, as opposed to a variant (b) in which World 2 is an emergent, irreducible part of World 1.

advance the development of science and technology, and thereby the further evolution of culture.

Propositions also make up the content of our fables and myths, and, in fact, they are the content of stories of all kinds, both true and false. In this way propositions and the abstract objects that are their constituents also serve the literary and aesthetic purposes of culture. In reading a fictional story, for example, we are given to understand that none of the references made in the story are to be taken literally, i.e., that all of the referential expressions occurring in the sentences of the story are understood to be deactivated, by which we mean that we are dealing with the intensional content of those referential expressions and not with any real objects that those expressions might otherwise be used to refer to in direct discourse. The same is true of stories that are put forward as descriptions of reality—except in those cases we indirectly re-activate the referential function of the expressions used in those stories by indicating, even if only implicitly, that the stories are to be taken as true. (Here, we see the significance of the law '(that ϕ is true $\leftrightarrow$ ϕ)', wherein an assertoric occurrence of a propositional form ϕ is connected with a nominalized occurrence of ϕ.) All stories are to be interpreted in this regard as a form of indirect discourse—such as the contexts that occur within the scope of an 'In-the-story' operator, which often is only implicit when we read, or are being told, a story. For it is only by first understanding the content of a story that we can then raise the question of its veracity, i.e., the question of whether or not there are states of affairs in the space-time causal manifold corresponding to the propositions that make up that story.

All fictional characters, on this account, are intensional objects—namely, the intensional objects that are the correlates of referential concepts. These intensional objects are accounted for in conceptual realism through a double correlation first of referential concepts with predicable concepts, and then of the latter with their concept-correlates. Formally, the predicable concept that corresponds to a referential concept, as represented, e.g., by the quantifier phrase '$(\mathcal{Q}xS)$', can be specified as follows:

$$[\mathcal{Q}xS] =_{df} [\lambda y(\exists F)(y = F \wedge (\mathcal{Q}xS)F(x))].$$

By λ-conversion, an intensional object falls under this predicable concept if, and only if, the concept whose correlate it is falls within the referential

concept; that is,

$$(\forall F)[(\mathcal{Q}xS)F(x) \leftrightarrow [\mathcal{Q}xS](F)],$$

which, in conceptual realism, amounts to a version of Frege's double correlation thesis (correlating second-level concepts with first-level concepts and the latter with their extensions). The intensional object that is the correlate of the referential concept expressed by '$(\mathcal{Q}xS)$', accordingly, is the concept-correlate of the predicable concept represented by '$[\mathcal{Q}xS]$'. It is such an intensional object that is the real constituent of a proposition, rather than the object, or objects, that the referential concept whose correlate it is might otherwise be taken to refer to in direct discourse. (See Cocchiarella 1989b for a detailed description of this double correlation, including how it generates the natural numbers as the correlates of our numerical quantifier phrases.)

In a specific story, say, A, both the propositions and the intensional objects involved in the referential expressions of that story may be relativized as follows,

$$[\mathcal{Q}xS]_A =_{df} [\lambda y(\exists F)(y = F \wedge In(A, [(\mathcal{Q}xS)F(x)])],$$

where '$[(\mathcal{Q}xS)F(x)]$' is a nominalization of the formula '$(\mathcal{Q}xS)F(x)$', and '$In(A, [...])$' represents the formula-operator 'In (the story) A, ...'. Thus, the referential expression 'Sherlock Holmes' will be taken to have one intensional object as its content in Conan Doyle's novel *The Hound of the Baskervilles* and a different intensional object in Conan Doyle's *The Valley of Fear*. (Because the singular term 'Sherlock Holmes' is used with existential presupposition in the fictional worlds of both novels, it is represented as having the logical form '$(\exists x Sherlock\text{-}Holmes)$' in the sentences that make up the written text of those novels; and therefore the intensional objects that are the constituents of the propositions making up the content of those novels are represented by, e.g., '$[\exists x Sherlock\text{-}Holmes]_{Baskervilles}$' and '$[\exists x Sherlock\text{-}Holmes]_{Valley}$', respectively.) Though these intensional objects are not identical, they are counterparts to one another in much the sense of David Lewis's counterpart theory. It is here among the intensional objects of our various stories—and not the among the concrete objects that exist in, and across, different causally possible worlds—that David Lewis's counterpart theory has its proper application.

It is the relativization of intensional objects in this way that explains the so-called "incompleteness" of fictional objects. There are many predicate expressions of English, for example, that can be meaningfully applied to humans

but that are neither affirmed nor denied of the character Sherlock Holmes in any of Conan Doyle's novels. Neither the formula '$In(A, [(\exists x Sherlock\text{-}Holmes)F(x)])$' nor '$In(A, [(\exists x Sherlock\text{-}Holmes)\neg F(x)])$' will then be true of the concept (as a value of 'F') that such a predicate might stand for, in order words, regardless which of Conan Doyle's novels we consider as a value of 'A'; and therefore, neither '$[\exists x Sherlock\text{-}Holmes]_A(F)$' nor '$[\exists x Sherlock\text{-}Holmes]_A([\lambda x \neg F(x)])$' will be true as well—which is to say that, in the story A, the character Sherlock Holmes falls under neither the concept F nor its complement, and is, therefore, "incomplete" in that regard.

Meinong's impossible objects, when construed as fictional characters or objects (or as intensional objects of someone's belief-space), are also "incomplete" in this way. Thus, whereas 'The round square is round and square' is false as a form of direct discourse—i.e., as analyzed as in section 4 above—nevertheless, it could be true in a given fictional context. Suppose, for example, we construct a story called, *Romeo and Juliet in Flatland*, which takes place in a two-dimensional world (Flatland) at a time when two families, the Montagues and the Capulets, are having a feud. The Capulets, one of whom is Juliet, are all circles, and the Montagues, one of whom is Romeo, are all squares. (Juliet has curves and Romeo has angles.) Unknown to the two families, Romeo and Juliet have an affair and decide to live together in secret. In time, Juliet becomes pregnant and, given the difference in genetic makeup between Romeo and herself, gives birth to a round square. Although Romeo and Juliet both love their baby, the round square, the two families, the Montagues and the Capulets, become enraged when they discover what has happened. They kill Romeo and Juliet, and their baby, the round square. But, not wanting it to be known that a round square—which, given the cruel social mores of Flatland society, would have been considered a monster—was born into either family, the Montagues and Capulets keep the birth, and death, of the round square a secret. They then pass it around that Romeo and Juliet were ill-starred lovers who committed suicide in despair of the open hostility between their respective families. The story ends with Romeo and Juliet being eulogized and buried together—but without their baby, the round square, whose body was cremated and reduced to ashes.

As this story makes clear, we can meaningfully talk about "impossible" objects as if they were actual objects—although such talk can be true only when relativized to a context of indirect discourse, such as a story, and perhaps the belief-space of someone with inconsistent beliefs. Thus, for example,

as part of the story, *Romeo and Juliet in Flatland*, it is true to say that the round square is round and square, which, formally, can be represented as follows:

$$In(R\&J\text{-}in\text{-}Flatland, [(\exists_1 x Square/Round(x))[\lambda x Round(x) \wedge Square(x)](x)]).$$

Thus, even though both

$$[\exists_1 x Square/Round(x)]([\lambda x Round(x)]),$$

and

$$[\exists_1 x Square/Round(x)]([\lambda x Square(x)]),$$

are false regarding the intensional content of 'The round square' *simpliciter*, nevertheless, both

$$[\exists_1 x Square/Round(x)]_{R\&J\text{-}in\text{-}Flatland}([\lambda x Round(x)]),$$

and

$$[\exists_1 x Square/Round(x)]_{R\&J\text{-}in\text{-}Flatland}([\lambda x Square(x)]),$$

are true of the intensional content of 'The round square' relativized to the story, *Romeo and Juliet in Flatland*. Nevertheless, as an object of a fictional, intensional world—as opposed to the objects of the actual world of nature—such an "impossible" object will be "incomplete" with respect to the different kinds of things that are in fact said of it in its fictional world. It is in this way that conceptual realism is able to explain the "incomplete" and "impossible" objects of Meinong's theory of objects. (See Cocchiarella 1987, chapter 3, for a more detailed account of how Meinong's theory can be reconstructed in the kind of framework we have in mind here.)

8 Concluding Remarks

As this informal sketch indicates, conceptual realism, by which we mean conceptual natural realism and conceptual intensional realism together, provides the basis of a general conceptual-ontological framework, within which, beginning with thought and language, a comprehensive formal ontology can be developed. Not only does conceptual realism explain how, in naturalistic terms, predication in thought and language is possible, but, in addition, it

provides a theory of the nature of predication in reality through an analogical theory of properties and relations. In this way, conceptual realism can be developed into a reconstructed version of Aristotelian realism, including a version of Aristotelian essentialism. In addition, through the process of nominalization, which corresponds to a reflexive abstraction in which we attempt to represent our concepts as if they were objects, conceptualism can be developed into a conceptual intensional realism that can provide an account not only of the abstract reality of numbers and other mathematical objects, but of the intensional objects of fiction and stories of all kinds, both true and false, and including those stories that we systematically develop into theories about the world. In this way, conceptual realism provides a framework not only for the conceptual and natural order, but for the mathematical and intensional order as well. Also, in this way, conceptual realism is able to reconcile and provide a unified account both of Platonism and Aristotelian realism, including Aristotelian essentialism – and it does so by showing how the ontological categories, or modes of being, of each of these ontologies can be explained in terms a conceptualist theory of predication and its analogical extensions.

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