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SCOTUS, FREGE, AND BERGMANN

Elsewhere, I pointed out some crucial differences between Scotus' *haecceitas* and Bergmann's bare particular, even though, as individuators, they share many interesting characteristics.[1] While Bergmann's bare particular is a momentary individual, *haecceitas* is a continuant. While Bergmann's bare particular is an individual which supports or possesses characteristics, *haecceitas* is not an individual but a principle of individuation. Further I went on to hint at the two structural roots from which such differences between *haecceitas* and the bare particular stem. First, Scotus and Bergmann philosophize under two different systems of logic and theories of predication. While Scotus is a pre-Fregean who does not distinguish between class inclusion and membership, Bergmann is a post-Fregean to whom the method of ideal language, i.e., the language of *Principia Mathematica*, is indispensable for philosophizing. Second, they seem to address different problems of individuation. While there is no place for a common nature in Bergmann's ontology, Scotus' problem of individuation is inconceivable without the common nature in itself. In this paper, I would like to discuss these two structural roots of the differences between *haecceitas* and the bare particular a bit further.

Interestingly, Frege looms large in understanding both of these structural differences between Scotus' and Bergmann's ontologies. Frege is the undisputed founder of modern logic. So, if the difference between Scotus' and Bergmann's ontologies are reducible to the difference between their logics, we have to ask first the implications of Frege's revolution in logic. Further, unlike Bergmann, Frege's ontology has a type of entity comparable to Scotus' common nature. For that reason, I believe that it is much easier to compare Scotus' ontology with Frege's ontology rather than to compare the former directly with Bergmann's ontology.[2] Indeed, if N. Cocchiarella's recent discussion of Frege's function-correlate is correct[3], we have reason to assimilate Frege's ontology to the Avicennian-Scotistic tripartite ontology of individuals, universals, and common natures in themselves.[4] Further, since Bergmann himself discussed Frege's ontology quite extensively[5], to the extent that Scotus' ontology is similar to Frege's ontology, we may have indirect evidence concerning how Bergmann would think about our interpretation of Scotus' *haecceitas* ontology.

Some may doubt whether my approach would result any interesting historical or ontological insight. But, to those who have tried to fill the gap between medieval and contemporary theories of individuation, the implication of this paper will be obvious. Current treatments of individuation are being

challenged by the possible return of the common nature.

My strategy will be as follows. In section A, I shall discuss Cocchiarella's thesis regarding Frege's function-correlates. In section B, by using Cocchiarella's thesis, I shall try to compare Frege's ontology with the Avicennian-Scotistic tripartite ontology. Some of the similarities and differences between these two ontologies will become clearer in the process. In section C, I shall examine Bergmann's interpretation of Frege's ontology. After having drawn attention to how Bergmann criticizes Frege's introduction of concept-correlates and value-ranges, we may understand, in section D, how Bergmann would view Frege's and Scotus' tripartite ontologies. Hopefully the peculiarity of Bergmann's theory of universals and his bare particular theory of individuation will stand out clearly against the background of Frege's and Scotus' ontologies.

A. Cocchiarella's Thesis

Cocchiarella's recent discussion of Frege makes it quite plausible that Frege's function-correlates are nominalized predicates and that Frege identified function-correlates with value-ranges.[6] Indeed, Cocchiarella's discussion is the stepping stone for the comparison of Scotus and Frege in the subsequent sections of this paper. But, in order to appreciate the significance of Cocchiarella's discussion, let me first briefly explain some of the elements of Frege's

[1]W. Park, "*Haecceitas* and the Bare Particular," forthcoming in *The Review of Metaphysics*, Vol. XLIV, (1990). See also, Jorge J.E. Gracia, *Suarez on Individuation* (Milwaukee: Marquette University Press, 1982), pp. 221–222, for some of the similarities between *haecceitas* and the bare particular.

[2]Some philosophers are unnecessarily hostile to the ontological reading of Frege. For example, M. Dummett treats the dispute between Kluge and Grossmann as "a beautiful example of the misconceptions of Frege that results from trying to fit him into the framework of traditional ontology." Dummett, *The Interpretation of Frege's Philosophy* (Cambridge: Harvard University Press, 1981), p. 177. In the same vein, he wrote: "Frege's ontology of objects, concepts, relations and functions is not a contribution to the traditional debate over particulars and universals, but clears it away and supersedes it." *Ibid*, p. 169. It is hard to believe that such a remark is made by the author of a book one chapter of which is devoted to "Frege's Place in the History of Philosophy." *Frege: Philosophy of Language* (New York: Harper and Row, 1973), pp. 665–684.

[3]N.B. Cocchiarella, "Frege, Russell, and Logicism: A Logical Reconstruction," in his *Logical Studies in Early Analytic Philosophy* (Columbus: Ohio State University Press, 1987), pp. 64–118. A somewhat longer version of this paper appeared in L. Haaparanta and J. Hintikka (eds.), *Frege Synthesized* (Dordrecht, Holland: D. Reidel, 1986), pp. 197–252.

[4]For an excellent introduction to Scotus' ontology, see J. Owens, "Common Nature: A Point of Comparison between Thomistic and Scotistic Metaphysics," in J.F. Ross (ed.), *Inquiries into Medieval Philosophy: A Collection in Honor of Francis P. Clarke* (Westport: Greenwood Pub. Co., 1967), pp. 185–209. Also, see, W. Park, "Common Nature and *Haecceitas*," *Franziskanische Studien*, 71 (1989), 188–192.

[5]G. Bergmann, "Frege's Hidden Nominalism" in his *Meaning and Existence* (Madison: The University of Wisconsin Press, 1959, 1968), pp. 205–224; Bergmann, "Ontological Alternatives" in his *Logic and Reality* (Madison: The University of Wisconsin Press, 1964), pp. 124–157. Both papers are also found in E.D. Klemke (ed.), *Essays on Frege* (Urbana: University of Illinois Press, 1968), pp. 42–63 and pp. 113–156, respectively.

ontology.

As is well known, the distinction between function and object is the most fundamental distinction in Frege's ontology.[7] This distinction corresponds to the distinction between function and argument in his conceptual notation which is meant to replace the traditional subject/predicate analysis of propositions.[8] Of course, Frege borrowed the notion of function from mathematics. But mathematicians in Frege's time did not have a clear idea about what a function is.[9] Frege generalized the concept of function in such a way that not only mathematical functions but also concepts can be subsumed under it. A concept is nothing but a function whose value is always a truth-value.[10] According to Frege, the nature of functional expressions are essentially predicative.[11] They are incomplete expressions with gaps which are to be filled by arguments. Corresponding to functional expressions, we have functions that are unsaturated entities.[12] Now Frege characterized an object as something that is not a function.[13] Every entity in Frege's ontology is thus either a function or an object. As examples of objects, Frege did not cite ordinary individuals but truth-values and the so-called value-ranges.[14] In commentators' list of Fregean objects, we find the following: individuals, function-correlates, numbers, value-ranges, and truth-values.[15]

As is clear from this list, both value-ranges and concept-correlates have been considered (separately) as Fregean objects.[16] To the best of my knowledge, Cocchiarella is the first to claim explicitly that Frege equated value-ranges with concept-correlates.[17] Why couldn't all other commentators of Frege notice of that equation? The reason seems something like this. Many philosophers such as R. Wells believe that the notion of value-range is the obscurest of Frege's basic notions.[18] But Wells says that it is very important because "it is his [Frege's] nearest approach to the modern notion of class."[19] What Wells and others have in mind is the notion of class in the sense of being composed of its members. And as long as one understands value-range as class in the sense of being composed of its members, there is no hope to see the equation. Cocchiarella flatly rejects this popular way of understanding of value-ranges.[20] According to him, they are "the saturated logical objects that Frege also informally called concept-correlates."[21] That means, as Cocchiarella makes clear, that "value-ranges are for Frege the denotata of nominalized predicates."[22] Now we turn to the comparison of Scotus' and Frege's ontology by assuming that Cocchiarella's interpretation is right.

B. Scotus and Frege

J. Owens admirably demonstrated that both Aquinas and Scotus developed

their theories of common nature against the Avicennian background. Let us briefly review Owens' explanation of the situation. Owens summarized Avicenna's doctrine of the common nature in itself in terms of the following three theses: (1) a common nature or essence is of itself neither singular nor universal; (2) the common nature in itself has no unity; (3) the common nature has its proper being. According to Owens, these Avicennian theses should be revised and qualified if the scholastic doctrine of the transcendentals is accepted. For if being and unity were thought to be coextensive, there can be nothing that has being but no unity. Aquinas gave up the Avicennian thesis (3), while Scotus denied thesis (2) by giving a real though less than numerical unity to the common nature in itself.[23]

Given such background information concerning the Avicennean-Scotistic tripartite ontologies, what would be the significance of Cocchiarella's thesis that value-ranges are concept-correlates? Though Cocchiarella himself values his own thesis in some different respects, what is important for my purpose in Cocchiarella's commentary is that in addition to the category of functions themselves, Frege had a unique category of concept-correlates, i.e., the denotata of nominalized predicates. Further if a concept-correlate can be equated with a value-range, as claimed by Cocchiarella, it may be the most important type of Fregean objects that are not ordinary individuals. As Cocchiarella points out, in order to understand what Frege had in mind, we should be very careful not to confuse the function itself with function-correlates. In order to express the distinction by using Church's lambda operator, we have to use $[\lambda x \varphi(x)]( )$ and $[\lambda x \varphi(x)]$ for the denoting function itself and function-correlate respectively.[24] The empty parentheses in the former expression indicate that the functional expression is incomplete and the corresponding function itself is unsaturated. As an incomplete expression, the functional sign cannot be placed in the subject position in a sentence. But functions themselves may have properties of their own. In order to express such higher order predication, we need nominalization of functional signs. Thus the denotata of nominalized predicates are correlated to the functions themselves. They are saturated logical objects whose expression can be placed in the subject position of a sentence. For example, we have a predicate '--- is horse,' and as its denotatum the function "--- is horse" itself. The nominalized form of the predicate '--- is horse' is the abstract singular term, 'horseness,' and its denotatum would be the functional-correlate "horseness." Then, there are three different ontological categories in Frege: individuals, function-correlates, and functions themselves. In Scotus, we have the common nature in itself, the common nature individuated in singulars, and the universal. Thus, we seem to have parallel tripartite ontologies in Scotus and Frege.

Our next step should be to see in what significant respect there are differences between Scotus' and Frege's tripartite ontologies. The most crucial point in this project must lie in the ontological status of functions and function-correlates: what kind of unity and being do Frege's functions and function-correlates have? In other words, we want to see Frege's position against the background of Avicenna's three theses and Scotus' corresponding theses.

Do functions and function-correlates have being? Yes! Since Frege treated function-correlates as objects, there is no doubt that function-correlates have being. Further, Frege seemed to claim that even functional expressions themselves have references.[25] So, Frege's position seems to be similar to Scotus at least in that both allowed some kind of being to each of the terms in their tripartite ontologies.

If Frege's function-correlates and functions themselves have some kind of being, then our next question should be the following: Do they also have unity?; If so, what kind of unity and what kind of being? But we have to resolve several problems at this point, because it is by no means clear whether Frege used 'being' always in the same sense. L. Haaparanta's discussion of the equivocity of being in Frege seems to be relevant here. She writes:

The above discussion shows that Frege assumes 'exists' and 'is' of

[8]Cocchiarella, *Op. cit.*, p. 76.

[9]For example, E.-H.W. Kluge wrote as follows: "Functions and objects — or more correctly, the notions of function and object — occupy a central place in Frege's metaphysics." E.-H.W. Kluge, *The Metaphysics of Gottlob Frege: An Essay in Ontological Reconstruction* (The Hague: Martinus Nijhoff, 1980), p. 41. Frege himself discussed the distinction in his papers, "Function and Concept" and "On Concept and Object." Both are found in P. Geach and M. Black (eds.), *Translations from the Philosophical Writings of Gottlob Frege*, second Edition (Oxford: Basil Blackwell, 1960, 1970), pp. 21–41 and pp. 42–55, respectively.

[10]Cf. Frege, "Begriffsschrift (Chapter 1)" in Geach and Black (ed.), p. 2, 12–13; "Function and Concept," p. 31.

[11]Cf. Frege, "Function and Concept," pp. 21–22.

[12]*Ibid*, p. 30.

[13]Frege, "On Concept and Object," p. 43.

[14]Cf. Frege, "Function and Concept," p. 24: "I am concerned to show that the argument does not belong with the function, but goes together with the function to make up a complete whole; for the function by itself must be called incomplete, in need of supplementation, or 'unsaturated'."

[15]*Ibid.*, p. 32: "An object is anything that is not a function, so that an expression for it does not contain any empty place."

[16]*Ibid.*, p. 32; Frege, *The Basic Laws of Arithmetic*, translated and edited with an Introduction by M. Furth (Berkeley and Los Angeles: University of California Press, 1964), pp. 35–36.

[17]For example, R.S. Wells, "Frege's Ontology" in Klemke (ed.), *Op. cit.*, pp. 17–18; Bergmann, "Frege's Hidden Nominalism," p. 207.

[18]Bergmann, "Frege's Hidden Nominalism," p. 207.

[19]Cocchiarella, *Op. cit.*, p. 76. C. Parsons' paper "Objects and Logic" also contains invaluable discussion of the same issues. C. Parsons, "Objects and Logic," *Monist* 65 (1982), pp. 491–516, esp., pp. 498–505.

[20]Wells, *Op. cit.*, p. 13.

[21]*Ibid.*

[22]Cocchiarella, *Op. cit.*, p. 76. Also, see his "The Double Correlation Thesis and Set Theories NF and ML" in his *Logical Studies*. There he claims that the notion of a set as a class that is composed of its members is none other than the iterative concept of set.

[23]*Ibid.*, p. 76.

> existence to have two readings: they may refer either to an empty first-order concept, which he tries to treat from a pragmatic point of view, or to a meaningful second-order concept. In the former case the existential statement becomes meaningful if it is transformed into a metalinguistic statement which expresses that a given proper name has a reference. In the latter case the statement tells us that a concept is instantiated, i.e., that there is an object which has a given property. First-order existence is formalized by means of the existential quantifier and the symbol for identity, while second order existence is expressed by means of the existential quantifier and the symbol for predication.[26]

Haaparanta philosophizes in the tradition of Hintikka, who has emphasized the fact that though many authors must have noticed the ambiguity of 'is' before Frege, it was Frege who for the first time clearly distinguished between these several meanings of 'is': (1) 'is' of identity, (2) 'is' of existence, (3) 'is' of predication, (4) 'is' of class inclusion.[27] Now, what Haaparanta points out in the above passage is this: Frege found an ambiguity even if one concentrated on 'is' of existence. 'Is' of existence may refer either to a first-order existence or to a second-order existence. On the ground that there are two such readings of 'is' of existence, she claims that Frege had an equivocity view of existence. But, if she is right, there seems to be an apparent conflict between Frege's and Scotus' views of being. For Scotus has been known as a champion of the univocity view of being.

But I believe that the alleged conflict between Scotus' and Frege's views of being is merely apparent. Let me explain why I believe so. Above all, Haaparanta's expression 'Frege's equivocity view of existence' seems to me a misnomer. Indeed, while Frege distinguished between the first-order concept of existence and the second-order concept of existence, Scotus was not armed with quantification theory, and consequently had the first-order concept of being only. But what seems relevant to our purpose here is the first-order concept of existence. Let us take an example of the second-order concept of existence: (∃x) Human x. Haaparanta would say that in this case "a concept is instantiated, i.e.,

[22]*Ibid.*, p. 67 and p. 76.

[23]Cf. J. Owens, Op. cit.

[24]Cocchiarella, *Op. cit.*, pp. 82–83.

[25]M. Dummett, "Note: Frege on Functions" in Klemke (ed.), *Op. cit.*, pp. 295–297.

[26]L. Haaparanta, *Frege's Doctrine of Being* (Helsinki: Acta Philosophica Fennica, 1985), pp. 140–141.

[27]J. Hintikka, "Semantics: A Revolt against Frege" in G. Floistad (ed.), *Contemporary Philosophy: A New Survey* (The Hague: Martinus Nijhoff, 1981), p. 72. Also see papers in S. Knuuttila and J. Hintikka (eds.), *The Logic of Being* (Dordrecht: D. Reidel, 1986).

[28]Haaparanta, *op. cit.*, p. 141.

[29]C.L. Shircel, *The Univocity of the Concept of Being in the Philosophy of John Duns Scotus* (Washington, D.C.: The Catholic University of America Press, 1942), pp. 3–4.

[30]W. Park, "Common Nature and *Haecceitas*," Franziskanische Studien, 71 (1989), 188–192.

[31]I. Angelelli, *Studies on Gottlob Frege and Traditional Philosophy* (Dordrecht: D. Reidel, 1976), p. 157.

[32]*Ibid.*

that there is an object which has a given property".[28] But is she referring to "humanity" that is a function-correlate or "____ is human" that is a function in itself? Does she interpret the formula as "there is an object which falls under humanity" or as "there is an object which is human"? When we raised the question as to whether the being of a function-correlate is the same as the corresponding function itself, the issue is not whether one of them is a first-order concept while the other is a second-order concept. Rather, we wanted to know whether we can place function-correlates and functions in the place of "g" in the formula '(∃x) g = x.' In other words, if the first-order concept of existence is formalized, as Haaparanta claims, by means of the existential quantifier and the symbol for identity, we are raising the question as to whether a function or a function-correlate can be placed in the argument position. The answer is negative as to the functions in themselves. For function itself is unsaturated, and only saturated object can fill the empty place. So, even if one were to use the same sense of 'being,' we are not prejudging the issue concerning the difference between a function and a function-correlate with respect to being.

Now we have to note that Scotus' univocity view of being is one of the most obscure among his theories. As C. Shircel reported, there are several divergent approaches to his univocity view of being.[29] I cannot discuss all these serious problems here. The only point I want to make is that even if Scotus would use the same sense of 'being' when he discussed the being of common nature in itself and the being of a universal, he could still allow different kinds of being to them. Even if Scotus used the term 'being' univocally to both God and creatures insofar as he was dealing with them as *ens inquantum ens*, he granted different degrees of being to them. As was pointed out, Scotus did not know about the second-order concept of being. Further, it is also clear that Scotus would allow the being proper to a common nature in itself that has lesser than numerical unity, because unity follows upon being. Then, the being of a universal and the being of the common nature in itself must be different, as the unity of universal is different from the unity of the common nature in itself. I would like to believe that Scotus used the first-order concept of existence in both cases, while fully conceding that the common nature in itself and the universal are beings in different degrees. That means, even though medieval philosophers had the first-order concept of existence only, the question still remains as to whether they would allow the same kind of being to the common nature in itself and to the universal. In a nutshell, I believe that we are making a category mistake if we detect a conflict between the so-called Frege's equivocity view of existence and the so-called Scotus' univocity view of being.

Now let us return to the problem of the unity and being. As was pointed out, Scotus acknowledged more than one type of unity.[30] On the one hand, the common nature in itself is neither individual nor universal; it has a lesser than numerical unity. On the other hand, individuals have numerical unity. Finally, universals also have a certain unity, i.e., unity of universals (or universal unity). I. Angelelli emphasizes this point when he writes:

> While the Aristotelian tradition, as well as Kant, had considered concepts as unsaturated entities (in a sense partially identical to Frege's Ungesättigtheit), the fact that concepts or universals are well-determined entities had also been stressed. Of course, the "individuality" of concepts were regarded as weaker than the individuality of real things, as a *unitas formalis* and not as a *unitas numerica*; still, it was a *unitas*.[31]

Angelelli goes on to point out that such a positive aspect of universals is preserved in Frege. Further, he explains that Frege "ought to stress the 'unity', the 'individuality' of concepts" (1) in order to solve the difficulties of the Euclidean definition of number, and (2) in order to reject Cantor's position on abstraction.[32] Thus, the situation is not so different in Frege's ontology from Scotus' ontology, as far as individuals and universals are concerned.

How about function-correlates, which corresponds to common natures in themselves? Did Frege allow numerical unity to function-correlates? The answer seems to be positive. For Frege allowed nominalized predicates to occupy the subject position or argument position in general in sentences. Function-correlates are saturated objects to which laws of logic are applicable. If so, in an important respect the parallel between Frege's and Scotus' tripartite ontologies would break down. For the common nature in itself in Scotus' ontology is devoid of numerical unity. Also, since unity follows upon being, unlike Scotus who granted being proper to the common nature in itself, Frege would not allow any difference between the being of function-correlates and that of functions themselves.

But how could Frege allow numerical unity to function-correlates? How could *horseness* be an individual which has numerical unity? After all, if he did not see any difference between ordinary individuals and function-correlates, why did he distinguish between "falling under" and "falling within"? It is strange that Frege did not subdivide the realm of objects into two kinds: ordinary individuals and the other types of objects. This line of thought reminds us of the fact that Frege characterized objects as that which are not functions. Why didn't he start from ordinary individuals and then characterized functions? It is true that in several places Frege used ordinary individuals as examples of objects. But it is still very strange that he did not give ordinary individuals as examples of objects immediately after he characterized functions and objects in his major writings.[33]

If Frege had to draw a sharp line between ordinary individuals and function-correlates, function-correlates would lose numerical unity. And that would be detrimental to Frege's logicism, if it means that one cannot place function-correlates in argument positions in sentences, particularly, in identity sentences. Be that as it may, it seems clear that Frege had some real difficulties with handling unity of objects and identity sentences.

But what would happen if one takes Scotus' strategy by giving lesser than numerical unity to function-correlates? Ordinary individuals have numerical unity, while logical objects have lesser than numerical unity.[34] The crucial issue is whether an entity having lesser than numerical unity can be placed in argument positions in sentences. If that is possible, there would be nothing to lose from Frege's part.[35]

But, of course, there are lots of difficulties involved in converting Frege into a Scotist in such a way. For example, there seems to be a crucial difference between Scotus' and Frege's views regarding the ontological priority among the three types of entities involved. In Scotus' ontology, 'common nature in itself' is a first intention notion. The common nature in itself is neither an individual nor a universal; it needs individuation to become an individual and it needs to be contracted by *haecceitas* to the individual. Thus, in a sense it is prior to individual. Since universals are the result of abstraction from individuals, they may have least priority among the three. On the other hand, in Frege's ontology, function-correlates are merely given by correlation to functions. In that sense, we may say that functions themselves are prior to function-correlates.[36]

With all such difficulties, however, it is quite impressive that we have parallel tripartite ontologies in Scotus' and Frege's ontologies. So, we now go on to examine Bergmann's interpretation of Frege's ontology in order to surmise how Bergmann would respond to our interpretation of Scotus' ontology.

C. Bergmann and Frege

There would be no place for the common nature in itself in Bergmann's ontology. For, according to him, there is no character that is not exemplified in the world.[37] But, in the previous sections, we saw that to some extent we can assimilate Frege's ontology to Scotus's ontology. That means, if Frege's notion

[30]Frege, "Function and Concept," p. 32; *The Basic Laws of Arithmetic*, pp. 35–36.

[31]Cocchiarella, *Op. cit.*, p. 80 wrote as follows: "That is, unlike sets whose existence or being is constituted by their members, concept-correlates, and therefore value-ranges, are "logical objects" whose determination is given by Frege's double correlation thesis . . . ."

[32]This issue needs extensive discussion of the role of the context principle in Frege as a prerequisite.

[33]Cf. Cocchiarella, *Op. cit.*, p. 80.

[34]It is what Bergmann calls the "principle of exemplification."

of concept-correlate is a counterpart of the common nature in itself, it would not be welcomed by Bergmann. As a matter of fact, Bergmann claims that the need for concept-correlates is the most obvious intrinsic flaw in Frege's system.[38] In this section, I would like to examine briefly Bergmann's interpretation of Frege's ontology. By observing how Bergmann criticizes Frege and how he distances himself from Frege, we may pave the way for better understanding of Bergmann's position.

In his paper, "Frege's Hidden Nominalism," Bergmann claims that the structure of Frege's ontology is nominalistic.[39] To show this, Bergmann first draws a distinction between two uses of the dichotomy of realism and nominalism: (1) the broad use, and (2) the strict use. In the broad use, a realist discerns many kinds of existents while a nominalist discerns only a few. In the strict use, a realist counts some characters as existents, while a nominalist counts no characters as existents.[40] In this context, Bergmann uses 'existent' for 'what philosophers, speaking philosophically, assert to "exist".'[41] According to Bergmann, Frege is an exuberant realist in the broad sense, but "in the strict sense at least implicitly a nominalist."[42] Further, he claims that Frege's exuberant realism in the broad sense was forced by his nominalism in the strict sense.[43] Furthermore, he claims that "the most obvious intrinsic flaw" of Frege's system is another consequence of Frege's hidden nominalism.[44]

What does Bergmann mean by Frege's hidden nominalism? From Bergmann's point of view, "while within his system at least Frege succeeded in securing full ontological status for his odd objects, he did not so succeed, even within the system, in the case of functions."[45] And he traces it back to what he calls "its root," i.e., "the contrast between exemplification and mapping."[46] In other words, Bergmann believes that by contrasting his exemplification ontology with Frege's function ontology, he can uncover the hidden nominalism of Frege.

Then, what is the crucial difference between Bergmann's exemplification

[38]Bergmann, "Frege's Hidden Nominalism," p. 218.
[39]*Ibid.*, pp. 205–224.
[40]*Ibid.*, p. 206.
[41]*Ibid.*, p. 205.
[42]*Ibid.*, p. 207.
[43]*Ibid.*
[44]*Ibid.*
[45]*Ibid.*, p. 212.
[46]*Ibid.*
[47]*Ibid.*, p. 208.
[48]*Ibid.*
[49]*Ibid.*
[50]*Ibid.*
[51]*Ibid.*, p. 209.
[52]*Supra*, n. 37.
[53]Bergmann, "Frege's Hidden Nominalism," p. 209.
[54]*Ibid.*
[55]*Ibid.*
[56]*Ibid.*
[57]*Ibid.*, p. 210.
[58]*Ibid.*, p. 211.
[59]*Ibid.*, p. 210. Interestingly, P. Tichy suggested an interpretation which directly contradicts this: "Frege tells us quite clearly that they [functions] are not mappings." P. Tichy, *The Foundations of Frege's Logic* (Berlin and New York: Walter de Gruyter, 1988), p. 21.
[60]Bergmann, "Frege's Hidden Nominalism," p. 210.
[61]*Ibid.*

ontology and Frege's function ontology? According to Bergmann, a realist starts from individuals and their characters, and uses 'Peter is blond' as the paradigm.[47] That suggests two major claims. First, in this paradigm, both 'Peter' and 'blond' stand for existents.[48] Second, the state of affairs that 'Peter is blond' stands for is actualized if the individual and the character enter into a certain relation — or what Bergmann prefers to say "nexus."[49] And this nexus is nothing but exemplification.[50] These two major claims imply, Bergmann points out, two further claims. First, the nexus is asymmetrical. While an individual may or may not exemplify a character, it is nonsense to say that a character exemplifies an individual. Second, in the paradigm 'Peter is blond,' the verb, i.e., 'is' of predication, stands for exemplification.

There may be many reasons why a realist adopts his position. But Bergmann wants to point out two weighty reasons why "in *some respect* individuals and characters are alike."[51] The first fundamental likeness is the principle of exemplification we saw above:[52] "Just as there is no individual that is not qualitied, so there is no character that is not exemplified."[53] The second likeness is that "neither an individual nor a character is the kind of entity . . . a sentence stands for."[54] According to Bergmann, this is another way of saying that 'Peter,' 'blond' and 'Peter is blond' stand for three different entities.[55] Again, Bergmann points out, this second likeness may be expressed, in Frege's terminology, by saying "individuals and characters are equally unsaturated."[56]

On the other hand, Bergmann observes that Frege's ontology starts from numbers and their functions and uses 'x^2' as the paradigm.[57] Bergmann's strategy in contrasting Frege's function ontology with his exemplification ontology is to show that "numbers and their functions differ from each other in the two fundamental respects in which . . . individuals and characters are alike."[58] If the relation between numbers and their function is so different from the relation between individuals and characters, Frege's strategy to apply his fundamental function/object analysis to a fact consisting of individual and character is a total failure.

Bergmann first wants to fix the meaning of function: "The current mathematical name for the crucial idea is *mapping*."[59] I cannot examine here whether his claim is correct and justified. What is important at this stage is to see why the notion of mapping does suit Bergmann's purposes. Apparently, Bergmann wants to emphasize the fact that the ontological status of functions is not as secure as that of objects. For he hastens to point out that "a function is a mapping rule, mapping each member of one of the classes upon one (and, in the paradigmatic case, only one) member of the other."[60] The heart of the matter, he believes, is that "a mapping rule . . . is a thing much more shadowy, much less

real, less palpable, less substantial than the things mapped and mapped upon."[61]

After presenting functions as mapping rules, Bergmann points out the two fundamental respects in which numbers and their functions differ from each other while individuals and characters are alike. First, Bergmann believes that there is no counterpart of the principle of exemplification in function ontology. For " . . . there are of course numbers whether or not they be either arguments or values of functions."[62] Second, while the notions of individuals and characters are equally saturated or unsaturated, "the notion of number neither contains nor presupposes that of a function. The latter, however, contains and presupposes that of the two ranges (of numbers)."[63]

As we have seen, Bergmann believes that ordinary individuals are one kind of object in Frege's system.[64] Further, he enumerates the following entities as what would be counted as objects: "individuals, numbers, truth values, value ranges (class of objects), senses, propositions (thoughts), concept correlates."[65] If Frege had used 'existent' as Bergmann does, Frege would have agreed, Bergmann assumes, that every Fregean object is an existent."[66] In other words, Bergmann refuses to view Fregean objects, which seem odd to him, as existents. Bergmann declares that he rejects Frege's exaggerated realism (i.e., realism in the broad sense).[67]

As is clear from Bergmann's list of Fregean objects, Bergmann counts value ranges and concept-correlates as two different kinds of objects. Both kinds are odd to Bergmann. And, interestingly enough, he tries to show how Frege was forced to have each of these odd kinds of objects by the very logic of his nominalism. He does it for value-ranges in section 3 of "Frege's Hidden Nominalism." Also, he does it for concept-correlates — the need of which is believed by Bergmann to be the most obvious intrinsic flaw of Frege's system — in section 4 of the same paper. Let us take a look at each of these cases.

According to Bergmann, Frege was forced to introduce "classes (extensions, value ranges)" into his ontology by the very logic of his nominalism.[68] He writes:

> Corresponding to each concept, which according to him is not an object and (if I am right) at least implicitly not an existent, Frege "creates" another entity, which according to him is an object, namely,

[61] *Ibid.*, p. 211.
[62] *Ibid.*
[63] *Ibid.*, p. 206.
[64] *Ibid.*, p. 207.
[65] *Ibid.*, p. 206.
[66] *Ibid.*, p. 207.
[67] *Ibid.*, p. 214.
[68] *Ibid.*
[69] *Ibid.*
[70] *Ibid.*, p. 215.
[71] *Ibid.*
[72] *Ibid.*
[73] *Ibid.*, p. 218.
[74] *Ibid.*
[75] *Ibid.*
[76] *Ibid.*
[77] *Ibid.*
[78] *Ibid.*
[79] *Ibid.*, p. 219.
[80] *Ibid.*
[81] *Ibid.*
[82] Dummett, *Op. cit.*, *Supra n. 25.*
[83] Bergmann, "Frege's Hidden Nominalism," p. 219.

the class of all objects which, as he says, fall under the concept.[69]

Then, he promises to give two reasons why Frege's nominalism forces him to create such an entity.[70] The first reason is that "Frege cannot and in fact does not, specify conditions of identity for concepts and functions."[71] The problem arises because if function is a mapping rule, the denotata of the functional expressions 'x^2' and '$x^2 - x + x$' cannot be the same. But, Bergmann points out, Frege must have wanted to preserve "what as a mathematician he surely wanted to preserve, namely, the equation '$x^2 = x^2 - x + x$' and the truism for which it stands."[72] So, Bergmann believes that Frege's way out is "to interpret it as an identity not between the two functions but, rather, between extensions."[73]

The need for concept correlates is, Bergmann claims, again a consequence of Frege's hidden nominalism.[74] He explains how such a need arises by referring to the infamous puzzle "The concept horse is not a concept." By taking sides with many commentators of Frege, he claims that it is a simple truism to say 'the concept horse is a concept.'[75] But, in Frege's system, every saturated expression beginning with 'the' is a name which denotes an object. However, since a concept is not an object, according to Frege, 'The concept horse is a concept' is false. So, Bergmann explains that in order to avoid this nonsensical consequence, Frege introduced a new kind of object, i.e. , the concept-correlate.[76]

Bergmann goes on to point out that "once the new kind, the concept-correlate, has been introduced, one cannot escape answering the question in what relation, or connection . . . it stands to the other two, the concept itself and its extension."[77] But, according to him, there is no answer to the question.[78] That is the major reason why Bergmann calls the need for creation of concept-correlates as 'the most obvious intrinsic flaw of the system *as it stands*."[79]

Further, Bergmann believes that, unlike value-ranges, a very simple emendation eliminates the need for the reification of concept correlates as a further kind of objects. Bergmann proposes to consider Frege's three basic grammatical categories exemplified by the following: (α) 'Peter,' (β) 'Peter is blond,' (γ) 'blond.'[80] Interestingly, Bergmann believes that only in the first two expressions do we have both a reference and a sense.[81] "The pattern does not apply to the unsaturated expression γ."[82] That means, Bergmann thinks that there is no such thing as the reference of the concept itself in Frege. As it turns out from Frege's posthumous writings, however, Frege had the reference of concept itself in his system.[83] By failing to note this, Bergmann thinks that "that dangling third entity, the concept correlate" is the trouble maker.[84]

D. Scotus and Bergmann

We opened this paper with discussion of the two possible structural roots of

the differences between Scotus' *haecceitas* ontology and Bergmann's bare particular ontology: (1) Scotus was a pre-Fregean, while Bergmann was equipped with modern symbolic logic; (2) Scotus' problem of individuation is inconceivable without the common nature, while there is no place for a common nature in Bergmann's ontology. Since Frege looms large in both points not only as a founder of modern logic but also as having a tripartite ontology comparable to Scotus, we compared Scotus and Frege in terms of the being and the unity of the terms involved in both. Also, we examined Bergmann's interpretation of Frege's ontology. Thus, now we should be in a better position to compare efficiently Bergmann's ontology with Scotus' ontology.

What is most impressive is that Bergmann flatly denies the need for exuberant tripartite ontologies. As he criticizes Frege's function-correlates and value-ranges, he would also criticize Scotus' common nature in itself. As he criticizes Frege's functions as nominalistic, he would also criticize Scotus' universals in the same vein. Then, among the so-called triple status of universals, the only aspect left is *universale in re*. Indeed, Bergmann believes that his ontology is the truly realistic one in that it secures the place for universals in the physical world and not in a Platonic heaven or in some mind. Since there is no common nature in itself in his ontology, for him the problem of individuation cannot be that of "what makes the common nature in itself indivisible (or incommunicable)?" or "what makes the common nature in itself contracted to this or that individual?", as it was for Scotus. Thus, while the problem of individuation was primarily a problem of incommunicability and only derivatively a problem of distinction (or numerical difference) for Scotus,[85] for Bergmann it was just the problem of explaining the numerical difference between the individuals of the same kind. While universals are used for explaining the sameness of the individuals within the same kind in Bergmann's ontology, bare particulars are meant to explain the numerical difference of individuals within the same kind.

There seems to be another interesting point that enables us to uncover the differences between Scotus', Frege's, and Bergmann's ontologies. Bergmann correctly observes that Frege would view function-correlates as existents (in Bergmann's sense). But, from Bergmann's point of view, it is odd to view them as existents. In order for entities to be existents in Bergmann's sense, they should have either numerical unity as individuals or universality as universals (in Bergmann's sense). Now, by using Bergmann's criticism of Frege as a springboard, Scotus would make the following comments. Bergmann is right to the extent that he views, unlike Frege, function-correlates as neither individuals having numerical unity nor universals having universality. But Bergmann is

[85]W. Park, "The Problem of Individuation for Scotus: A Principle of Indivisibility or a Principle of Distinction?," forthcoming in *Franciscan Studies*, Vol. 48, Annual XXVI (1988) to appear in 1990.

wrong to the extent that he refuses to allow any unity, e.g., lesser than numerical unity, and thereby any corresponding being to function-correlates. Frege is right to the extent that he grants being and unity to the third type of entities, i.e., function-correlates. But Frege is wrong to the extent that he gives *numerical* unity to function-correlates.

These results do not seem to bring about, of course, the clean explanation of how the two structural differences between Scotus' and Bergmann's ontologies led to the differences between *haecceitas* and the bare particular. But our discussion may at least shed some light on the second structural difference, i.e., that Scotus and Bergmann seem to discuss different problems of individuation. By assimilating Frege to Scotus, I hinted at how to welcome the long awaited and inevitable return of the common nature. I believe that the current discussions of individuation without common nature are empty. As far as the first structural difference is concerned, I have to concede that not much was achieved in this paper. The emergence of modern logic must be at the core of the philosophico-historical explanation of the differences between Scotus and Bergmann. But, as it turns out, it is not easy to determine whether Bergmann's ontology, in particular his theory of individuation, is the background ontology of Frege's logic. For we have seen above that in many respects Frege is more similar to Scotus than Bergmann. Probably, we will be able to learn a lot by further comparison of Frege and Scotus. For example, one might want to exploit Frege's innovation in understanding Scotus' obscure theory of *haecceitas* or to modify Scotus' theory in some respects in the light of Fregean logic. On the other hand, one may use Scotus as a measure of Frege's ontological development. Frege had started his career as a mathematician, and worked on the borderline between mathematics and philosophy. By having a glimmering of function-correlates, wasn't Frege becoming a *lesser-than-subtle* doctor?