

LOGIC
AND
REALITY

By the Same Author

THE METAPHYSICS OF LOGICAL POSITIVISM

PHILOSOPHY OF SCIENCE

MEANING AND EXISTENCE

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THE UNIVERSITY OF WISCONSIN PRESS

MADISON 1964

Ontological Alternatives*

IN A recent essay¹ Dr. Egidi, stating what she takes to be Frege's ontology, starts from and uses throughout as a foil what in another essay² I have said about Frege. She holds that Frege is an idealist, takes me to hold that he is a nominalist. As I use 'nominalism', Frege is not a nominalist. Nor did I ever say that he was one. I merely tried to show that there is in the very structure of his ontology a tendency toward nominalism. That makes the title of my essay, "Frege's Hidden Nominalism," suggestive rather than accurate. In spite of what Dr. Egidi says, I still believe that the nominalistic tendency is unmistakably there. Nor has she convinced me that Frege is an idealist. She has, however, shown very convincingly what I, for one, had not seen as clearly as she does, namely, that there is also an unmistakable structural tendency toward idealism in Frege's ontology. Thus, if I were asked to choose for her essay a title as suggestive and as exaggerated as mine, I would call it "Frege's Hidden Idealism."

Those who are merely clever sometimes discover tendencies which are not there. Those who discern hidden tendencies which are there think structurally and, sometimes, profoundly. In my judgment Dr. Egidi's essay is of a profundity that deserves high praise. Yet I also judge much of what she says to be radically mistaken. Because of these mistakes she makes an idealist out of Frege. Her mistakes reflect the idealistic ambience that has nourished her. So she should not be blamed

* This is the English original of "Alternative Ontologiche: Risposta alla Dottoressa Egidi," which appeared in *Giornale Critico della Filosofia Italiana*, 17, 1963. Printed by permission.

¹ "La Consistenza Filosofica della Logica di Frege," *Giornale Critico della Filosofia Italiana*, 16, 1962, 194-208. See also her "Matematica, logica e filosofia nell' opera di Gottlob Frege," *Physis*, 4, 1962, 5-32. The essays will be cited as CFLF and MLFF, respectively.

² "Frege's Hidden Nominalism," *Philosophical Review*, 67, 1958, 437-59. See also "Propositional Functions," *Analysis*, 17, 1956, 43-48.

for them too severely. Those who know how difficult metaphysics is also know that, since its core is dialectical, there is nothing paradoxical about judging an essay in metaphysics to be both profound and profoundly mistaken.

Dr. Egidi, I just said, makes an idealist out of Frege. This is not quite accurate and the inaccuracy is of a sort to which one as committed as she is to accurate intellectual biography might well object. Explicitly she merely claims that Frege's renovation of logic and, inseparably from it, his analysis of the simple clause '*a is F*' is implicitly idealistic, i.e., that it fits with or perhaps even suggests an idealistic ontology, just as in her opinion Aristotle's logic and philosophical grammar fit only with the realistic ontology he actually propounds. If you wish, replace "fits and perhaps even suggests" by "inspires and perhaps even is inspired by." The idea is clear. I express it by calling a claim of this sort structural. Structurally, Dr. Egidi claims, the philosophical grammar of the *Begriffsschrift* is idealistic.

My own concern is exclusively structural. That determines what I shall say as well as the order in which I shall say it. In Section One I shall state and unravel the relevant part of the fundamental ontological dialectic. Section Two is about Frege. In Section Three some of Dr. Egidi's arguments will be examined. In Section One, which must be most succinct, the main issues will be stressed at the expense of all the details which may be found elsewhere.³ Since in Section Two it will be taken for granted that Frege's ontology is realistic, I refer to a recent essay by Reinhardt Grossmann⁴ in which this appraisal, which as it happens is also the traditional one, has been freshly examined and impressively documented, structurally as well as biographically.

I

Mind is One; the world is Many. This is but an aphorism. Aphorisms must be unpacked. Yet they remain suggestive even after they have been unpacked. Also, they allow us to express our sense of debt to and continuity with the tradition. That is why I shall try to expose the deepest roots of the idealism-realism issue by unpacking this particular aphorism. Nor, since they are so deep, are they the roots of just this one issue. But I shall focus on it.

To exist or to be an *entity* is one and the same. Your or my now or at some other time perceiving or remembering or imagining that Peter is blond is called an *act*. Peter's being blond is the single *intention* of

³ See in particular the first four essays of this book.

⁴ "Frege's Ontology," *Philosophical Review*, 70, 1961, 23-40; see also his "Conceptualism," *Review of Metaphysics*, 14, 1960, 243-54.

these several acts. Acts are *mental* entities. Peter's being blond is a *nonmental* entity. The intentions of some acts are mental; those of some others, nonmental. Restating these bits of common sense shows how, commonsensically, 'entity', 'act', 'intention', 'mental' and 'nonmental' will be used. Idealism holds that all entities are mental; materialism, that they are all nonmental. Only realism₂ sides with common sense, asserts that (1) some entities are mental, some nonmental. Materialism we may safely dismiss as absurd. (1) by itself is an empty husk. Realists₂⁵ also must assert and justify that (2) minds can know what is nonmental. To justify (2) is to present and to defend against all dialectical attacks an ontological assay of acts and their intentions that fulfills two conditions. (a) When I believe what is false, the act is there, its intention is not. The assay must account for such acts. (b) The assay must provide a "connection" between an act and its intention which is so "close" that it justifies (2), irrespective of whether the intention is (α) mental or (β) nonmental. (α) leads to the dialectic of the Cartesian *Cogito*; (β), to that of (2). An example will help. According to the Aristotelian-Thomistic account of perception, when I perceive a tree, two substances, mine and the tree's, exemplify one universal. Clearly, this "connection" is sufficiently "close." The dialectical difficulties of (a) and (b) are notorious. So I need not and shall not here consider them except as they impinge upon that particular piece of the dialectic I propose to unravel.

(What has been said in the last paragraph suffices to unpack the aphorism that *epistemology is merely the ontology of the knowing situation*. This use of 'knowing' is of course generic, comprehending the several *species* of perceiving, remembering, believing, imagining, doubting, entertaining, and so on. Henceforth 'species' will be used only for these kinds of "knowing.")

Yesterday I perceived that Peter is blond. The act that would have occurred if instead of perceiving this fact I had remembered it is different from the one that actually occurred. This no philosopher has ever questioned. That shows that they all take two things for granted, namely, first, that an act and its species are both mental entities, and, second, that the latter is a constituent of the former. If instead of perceiving that Peter is blond I had perceived that Mary is tall, is the act that would have occurred different from the one that actually occurred? Their intentions are different, but they are both nonmental.

⁵ The meaning of 'realism' in 'realism-nominalism' is radically different from that in 'realism-idealism'. The first dichotomy, being one of general ontology, lies deeper than the second. The choice of subscripts reflects this difference.

Prima facie that provides an ontological alternative. One may hold that the "two" acts are one and not two. Or one may hold that each act has a constituent such that in two acts this constituent is the same if and only if they have the same intention. Call a constituent of this sort a *thought*. As one ordinarily speaks, 'thought' is used in two ways. (Once the word stands for the act itself; once for a constituent of it which varies with its intention. That makes our use of 'thought' in this essay technical, although only in the very limited sense that we shall employ the word in only one of the two ways in which we employ it when speaking as we ordinarily do. (Some philosophers use 'thought', technically, as I use 'intention'. The dangers and inconveniences of this use are obvious.) Thoughts, as we use the word, are constituents of acts. Hence, *if* there are thoughts, they are mental entities. If there are none, then what I am about to assert of them holds of acts, i.e., of those mental entities which, speaking as we ordinarily do, we sometimes also call thoughts. That is why I need not as yet commit myself as to whether or not there are thoughts.

An ontology is an inventory of what exists (is there). In his own peculiar way and for his own peculiar purposes, an ontologist, therefore, describes the world. His description is inadequate unless it accounts by what is for what is (phenomenologically) presented to us. I shall next call attention to two striking features of what is so presented. *No* ontology, therefore, is adequate unless it accounts for both of them. That is why I shall not make any specific ontological commitment until these two features have been stated and the dialectics which because of them *every* ontology must face has been exhibited.

Call a thought unitary if and only if it has no constituent which is itself a thought. All thoughts are unitary. This is one of the two striking features. Call it the *unity of thought*. Replace 'unity' by 'One', 'thought' by 'mind' and you will see that the first half of the aphorism is already unpacked.

Some hold that awareness is propositional, i.e., that there are no thoughts whose intentions are not represented by sentences. If so, then all thoughts whose intentions are represented by simple clauses are unitary. Take the thought whose intention is represented by 'Peter is blond'. The only thoughts that could be constituents of it are those of Peter, of is, and of blond. If awareness is propositional then there are no such thoughts and the unity thesis asserts something new or further only for those thoughts whose intentions are represented by compound sentences. As it happens, though, the arguments for such thoughts being unitary are the same as those for all thoughts being unitary. Thus, once more, we need not commit ourselves.

If the unity of thought is a striking (phenomenological) feature, what need is there for arguments to support it, what point in arguing against it? The question is reasonable indeed. The reasonable answer is that the arguments in support merely clear up the misunderstandings which have been caused by the (phenomenologically) inaccurate way in which many philosophers and psychologists have described what is called introspection or introspective analysis. Introspection presumably "decomposes" thoughts into their constituents. What actually occurs when one introspects a thought is a series of further thoughts that fulfill certain conditions. Two such conditions are, first, that the intention of each member of the series is a constituent of the intention of the thought that is being "decomposed," and, second, that the intentions of all members of the series are all the constituents of the intention of that thought. A thought's being unitary (a) and its intention having no constituents (b) are two propositions and not one. The invalid inference from (a) to (b) is one of the pivots of the traditional dialectic. Of that more presently. The invalid inference from the negation of (b) to the negation of (a) is the main source of the misunderstandings that may weaken one's grasp of the unity of thought. The premiss as well as the alleged conclusion of an invalid inference may be either true or false. (a) is true. How about (b)? One's answer depends on his grasp of the second feature.

Unless some intentions were mental, we could not know that there are minds, just as we could not know that there are nonmental entities unless some intentions were nonmental. The difference between the mental and the nonmental is itself (phenomenologically) presented to us. Call the part of the world which is nonmental the truncated world. The idealists claim that the truncated world does not exist. The second feature strikes us most forcefully in nonmental intentions. As to whether it is also a feature of minds we need not as yet commit ourselves. I shall therefore call attention to it by attending to some nonmental entities *as they are (phenomenologically) presented to us*. And I shall save words by omitting the italicized phrase. That the omission does not prejudice anything will soon be clear beyond doubt.

Take a spot which is red and round. The spot is an entity; its shape (round) and its color (red) are two others. The latter (red, round) are *constituents* of, or as I shall also say, they are "in" the former (the spot). An entity which has constituents is *complex* or a complex. If you challenge any of this, I answer that the example shows how in ontology I use 'constituent' and 'complex' and that therefore there is nothing to be challenged.

Take two spots; one red and round, the other green and square. Red

and round are "tied" together. So are green and square. Red and square are not. Nor are green and round. That is why there are two spots and not four and why these two are what they are. That shows two things. *First*. There is a sort of entities which are constituents of others and yet so "independent" that a complex is more than, as one says, the sum or class of them. Entities of this sort I here call *things*. This is of course a very special use of the word. *Second*. The something more, the "tie" which makes a complex out of the class, must have an ontological ground. Everything except sameness and diversity must have an ontological ground. One who does not understand that does not understand the task and nature of ontology. The entity or entities which are the ground of the "tie" I call *subsistents*.

In the *truncated world as it is (phenomenologically) presented to us* there are many things. This is the second striking feature. If it were not for the italicized word and the italicized phrase, we would already have unpacked the second half of the aphorism: The world is Many. It will be better if before finishing this job I interrupt for four comments which, although they are badly in need of expansion, may yet help to avoid puzzlement.

1. Not all subsistents are "ties," but they are all "dependent" in the sense in which things are "independent." Since the distinction corresponds to the traditional one between *categorematic* and *syncategorematic*, I shall also use these two words even though the traditional distinction is among words rather than, like mine, among the entities which I hold these words represent. That is not to say that there are two (or more) modes of existing. 'Exist' is univocal indeed. Otherwise I, for one, do not know what it means to exist. But there are several kinds of *existents* and the differences among the highest kinds or *modes* are very great indeed. *Categorematic* and *syncategorematic* are two modes.

2. A thing that has no constituent which is a thing (except, as the mathematicians speak, trivially itself) is called *simple* or a simple. What has been said so far does not at all depend on whether or not there are simples. Among subsistents the distinction simple-complex does not even make sense. Nor do syncategorematic entities need further ones to connect them with the categorematic entities they connect. (Thus Bradley's paradox is avoided.)

3. Complexes are constituents of other complexes. They are also "independent" in the sense in which I just used this ambiguous word. As I proposed to use 'thing', that makes complexes things, which is rather awkward, since the most interesting complexes are of the kind one would rather call facts, in ontology as well as when speaking as we

ordinarily do. The cause of the awkwardness is that any classification of complexes, e.g., in "facts" and "complex things," requires some of those specific ontological commitments which I as yet wish to avoid. In an ontology that admits simples, for instance, one could reserve 'thing' for simples and divide all "independent" entities into two kinds, things and complexes.

4. Minds are in the world, of course. Are they, too, Many? Less aphoristically, are acts complex? I have not as yet committed myself. But we understand already why, *if* acts are complex, this feature imposes itself less forcefully in their case. Thoughts are unitary, i.e., they have no constituents which are thoughts. That is not the same as being things and being simple. Yet the ideas are close. Nor is there any doubt that even if its thought is merely one among the constituents of an act, it imposes itself so forcefully that the others are easily overlooked.

The task of ontology is to account for what is (phenomenologically) presented to us. If one holds that awareness is propositional, he must also hold that all (nonmental) intentions are complexes. Everyone agrees that some are. Every ontologist must account for this manifold (complexity). The realist₂ accounts for it by a corresponding manifold in the truncated world of which, unlike the idealist, he claims that it exists. At least, that is for him structurally the obvious way to account for the second striking feature. Nor do I know of any articulate realistic₂ ontologist who has found another way. That fully unpacks the second half of the aphorism. The world is Many.

The basic dialectic that controls the realism-idealism issue has *three centers*. The interactions among these centers determine the ontological alternatives which are or seem available to us.

Most ontologies, whether realistic₂ or idealistic, recognize that there are things, be they mental or nonmental or either. Very few recognize the ontological status of the subsistents, i.e., they do not recognize that the syncategorematic *terms* represent *entities*. The only two recent exceptions from this almost universal neglect are Frege and the early Husserl, i.e., the author of the *Logische Untersuchungen*. That is indeed one very major reason for my admiration of these two thinkers. Characteristically they are both realists₂. Ontologies which do not recognize the syncategorematic entities I call *reistic*. For an ontology to be realistic₂ is one thing; to be reistic is quite another thing. A reistic ontology, we know, cannot be adequate. It cannot even account for the truncated world. This impossibility is the *first center*. The unity of thought must be adequately accounted for. That task is the *second center*. To spot the third, remember the old idea of adequation, *ade-*

quatio rei et intellectus. If mind (thought) is One and the (truncated) world is Many, how can a unitary thought be adequate to a complex intention? This difficulty, or apparent difficulty, of reconciling the One and the Many in the knowledge situation is the *third center*.

A realistic₂ ontology cannot be adequate unless it fulfills three conditions. It must not be reistic. It must account for the unity of thought. It must resolve the difficulty of adequation. Or, to hark back to what has been said earlier, the realist₂ must show that in his world the "connection" between a unitary thought and the complex it intends is so "close" that he can defend against all dialectical attacks the proposition which he must hold lest his realism₂ remain an empty husk, namely, that minds may know what is nonmental. That unpacks and thereby gets rid of that old phrase, *adequatio rei et intellectus*. (Let me point out, in parenthesis, since at this point I neither need nor wish to make any specific ontological commitment, that as far as the third center is concerned it makes no dialectical difference whether the complex intention is mental or nonmental. That is why I am convinced that the crucial task is an adequate ontological assay of the act and that the realism-idealism issue *as such* is rather shallow, or, at least, that it does not lie as deep as it was thought to lie during the last three hundred years or so, ever since the structural drift toward idealism which has still to be stopped got its start for reasons that will be touched briefly at the very end of this essay.)

Let us look at the alternatives open to one who does not know how to meet all three conditions. An ontology which is reistic as, alas, almost all are, cannot even adequately account for the truncated world. This inadequacy and its source need not be clearly seen in order to be more or less strongly felt as a difficulty. Its source, we know, is the second feature, which, as we also know, imposes itself more forcefully in the truncated world. That shows how one may be tempted to choose the idealistic alternative.

If one shrinks away from the absurdity of idealism he still has two alternatives left. He may relieve the pressure from the third center by opting for materialism. If one also shrinks away from the absurdity of materialism he has only one alternative left. He may relieve the pressure from the second center by doing violence to the feature that is its source, making thought complex. That also removes the pressure from the third center (adequation). Thus, if he remains insensitive to the subtler pressure from the first center (inadequacy of all reistic ontologies), he may be content. This is the choice or, at least, it is the tendency as well as the basic weakness of the British succession from Locke to Russell. In Locke and Berkeley it remains a tendency; they at

least still recognize the act. Hume makes the choice. For him, all mental entities are mosaics of sense data. Literally, the phenomenalism which so frequently also appears in this succession is of course a kind of idealism. Structurally, though, as well as in flavor, it is more often than not materialistic. Russell oscillated between these two equally unattractive alternatives, phenomenalism and materialism, all through his career.⁶

I am ready to state my own ontological commitments and to show that they meet the three conditions every adequate realistic₂ ontology must meet. But it will be better if first I say what in ontology I mean (and what I believe most philosophers have meant) by 'universal' and 'individual', and, also, how I use the two labels 'realism₁' and 'nominalism'.

Take two spots of exactly the same color, say, red. An ontologist may account for their both being red by a single entity which is "in" both of them. Such an entity is a *universal*. Ontologists who hold that there are universals may differ in what they hold about them.

Assume that two spots agree exactly not only in color but in all (nonrelational) properties. (I ignore in this essay relational universals as well as those of higher types. Relations, however, are not "in" any of the several entities they relate.) Every ontology must solve the problem of individuation, i.e., in the example, it must account for there being two spots and not just one. One way of solving the problem is by two entities, one "in" each spot. Such an entity is an *individual*. All ontologists who accept individuals make them *things*, not subsistents. There is also always more or less clearly the idea that an individual is a *simple*. I say more or less clearly because the conflict between this idea and some others which philosophers also have had about individuals is notorious.

(The expressions referring to) individuals cannot be predicated of anything. All ontologies recognize this obvious difference between individuals and universals. Some ontologists introduce another. Universals,

⁶ The concern here is only with intellectual *reasons*, not with personal or cultural *motives*. Of course there are such motives. They may and often do affect the choice. For many they are indeed its only determiners. The absurd doctrine that these motives are the only determiners, or the only important or perhaps even the only valid ones for *all* is not, alas, limited to Italy, but I notice of late a certain recrudescence of that doctrine in the neo-Croceans of both extremes. If these gentlemen were right, then there wouldn't be any history of philosophy for them to write about. Nor, if it were not for the *few* who are sensitive to dialectical pressures, would there be alternatives for the many to choose from according to those motives. One need not reject what makes sense in either Marx or Croce to avoid such intemperate extremes.

they hold, differ qualitatively; individuals are merely numerically different. In the Anglo-Saxon tradition such individuals are called *bare particulars*. Ontologists who accept bare particulars implicitly recognize that sameness and diversity are primary, i.e., that they and they alone need no ontological ground. An ontologist who explicitly recognizes that faces squarely the striking feature Aristotle first faced when he introduced his notion of matter. The difficulties of that notion are notorious. Yet, every adequate ontology must come to terms with the feature.

Bare particulars are one extreme, individual substances are the other. In most classical ontologies, particularly those of the Aristotelian-Thomistic variety, individuals are substances. Substances and universals are both things, i.e., they are both "independent" (as I used this ambiguous word), but there is nevertheless an ontological difference between them which (in another sense of the word) makes the former "more independent" than the latter. Clearly that depresses the ontological status of universals as compared with individuals.

Few ontologists have completely ignored the problem of accounting for "sameness in diversity" in such cases as that of the two spots of exactly the same color. Quite a few, though, took the problem rather lightly. Perhaps they were too concerned with epistemology, not enough concerned with ontology. Some of these tell psychological stories which may or may not be more or less true but are completely irrelevant to the ontological problem. To call only such patently inadequate assays nominalistic seems to me a waste of a good word. I rather speak in such cases of dead-end nominalism.

I call an ontology *realistic₁* if and only if its individuals and its universals are both things and there are only two fundamental ontological differences between them; one, the obvious one; the other, that individuals are only numerically different (bare).⁷ To call all other ontologies *nominalistic* may seem and, as things now stand, probably is idiosyncratic. But it is anything but idiosyncratic to insist, as I do, that any ontology which depresses the ontological status of universals as compared with individuals is *nominalistic in tendency*. Every one familiar with the *structural* history of the dialectic will appreciate that. In ontologies which make universals syncategorematic entities the nominalistic tendency is as pronounced as it can be, stops just one step short of the dead end.

⁷ There is the *prima facie* possibility of realistic₁ ontologies in which the only difference is the obvious one. But they encounter structural difficulties that lead quickly to catastrophe.

In my world there are individuals and universals (characters). All individuals are simple and bare. A character is either simple or complex. In all other respects, except for the obvious difference, individuals and characters are alike. That makes me a realist₁. In my world there are also subsistents. Not being reistic, my ontology fulfills the second of the three conditions every adequate realistic ontology must fulfill. Its fundamental tie is *exemplification*. In 'Peter is blond' it is represented by 'is'. Peter's being blond is a complex of the kind called a *fact*. (The other kind are the complex characters. Their ontological status, though, is merely derivative. Thus we can safely ignore them in this essay.) "In" the fact represented by 'Peter is blond and Mary is tall' there are two others, Peter's being blond and Mary's being tall, as well as the subsistent, represented by 'and', which ties them together. And so on. The idea is clear, I trust. My world is not "atomistic"; it is not just a class or collection of disjointed entities. Rather, it is *completely structured*.

(A *Begriffsschrift* or ideal schema (language) reveals the explicit or implicit ontology of its author. Although I shall presently introduce a few abbreviations, I shall not in this essay use a schema of my own. But it will help to bring out an important point if we consider what in such a schema the transcription of 'This spot is red and round' would be. If 'a', 'red', and 'round' are made to represent the individual and the two characters "in" the spot, respectively, then the transcription reads 'a is red and a is round'. Thus it looks very much like the sentence which it transcribes even though 'a' does not represent the spot but, rather, the individual "in" it. The spot itself, in this world, is the fact represented by the sentence! That is the point which the schema helps to bring out.)

In my world acts are very similar to spots. Take a case of my perceiving the fact *P*, namely, that Peter is blond. In my world there are thoughts, e.g., the-thought-that-Peter-is-blond (¹*P*¹). An act is an individual exemplifying two simple characters; one is a species (perceiving, believing, remembering, and so on); the other is the thought "in" the act. The act in question, for instance, is the fact which (in my schema) is represented by '*b* is perceiving and *b* is ¹*P*¹', with *b* representing the individual "in" it.⁸ Such (mental) individuals I call aware-

⁸ '*b* is perceiving' is not very idiomatic. We would rather say '*b* is a perceiving' and '*b* is a thought-that-Peter-is-blond', just as we say 'Peter is a man' rather than 'Peter is man' even though we also say 'Peter is blond'. If perceiving, the-thought-that-*P*, man, and blond are four characters, as in my world they are, then such idiomatic strain or awkwardness is irrelevant. Nor could a schema be what it is supposed to be if it conformed in *all* contexts to the idioms of this or that language.

nesses. ¹*P*¹ is simple. *All thoughts are simple characters*. Thus I account for the unity of thought, meet the first condition every adequate realistic ontology must meet. Notice, too, that since thoughts are universals, you and I may literally have the same thought although a thought is a mental entity and although of the two individuals which exemplify it when you and I both have it one is in my mind and one is in yours.⁹

In my world there is a subsistent, *M*, such that ¹*P*¹ *MP* is a formal fact. '*M*' transcribes the word 'means' as we sometimes use it in such sentences as 'the-thought-that-Peter-is-blond means (intends, is about) Peter is blond'. A fact is formal or a fact of (in) the world's form if and only if the sentence representing it is analytic.¹⁰ Through the thoughts "in" them, acts are by the subsistent I call *M* "connected" with their intentions. That immediately raises three questions.

First. Is the "connection" sufficiently "close" to fulfill the third of the three conditions? One only has to consider such complex facts as *P*-and-*Q* and *P*-or-*Q* in order to realize that some subsistents establish connections which are very loose indeed. (If they were closer, fewer ontologies would be reistic.) Thus the question is very reasonable. All I can say here is that the required closeness is accounted for by ¹*P*¹ *MP* being a fact in the world's form.

Second. The-thought-that-Caesar-was-murdered and the-thought-that-Calpurnia's-husband-was-murdered are two, not one. Yet they *seem* to mean (*M*) the "same" fact. Can two thoughts mean a single fact? The affirmative answer bogs down in difficulties which are insuperable. This is the logical problem of intentionality; or, rather, it is the logical aspect of the problem of intentionality.¹¹ Since it can be kept out, I shall keep it out of this essay, merely drop a hint that will come

⁹ Frege tried very hard to account for this piece of "realistic" common sense. That is indeed a major intellectual motive for his inventing those nonmental entities he calls senses (*Sinn*) and which therefore, revealingly even though most misleadingly, he also calls thoughts.

¹⁰ This is merely a convenient hint. Lest it be misleading, I add that the basic idea (the world's form) is ontological, not logical (analyticity). A world's form is what it is because its subsistents are what they are. Our notion of analyticity is grounded in the form of the only world we know.

¹¹ It is a measure of Frege's greatness that he was (as far as I know) not only the first who clearly saw the logical problem of intentionality but that he also realized its ontological import. That provided *another* major intellectual motive for his eventually hypostatizing senses (thoughts) as nonmental entities. That he missed the solution, in spite of this hypostatization and even though he recognized that some subsistents exist, is a measure of his failure. His fear was that he would have to give up all definitions. How typically a mathematician's fear! See also *Meaning and Existence*, p. 217, and the crucial passage from "Begriff

in handy soon. The key to the solution is the recognition that the subsistents exist. For, if they exist, then two facts (complexes) are literally the same, i.e., one and not two if and only if (1) the simples in them are the "same" and (2) these simples are "tied" to each other in the same way. Upon this strict use of 'same', P and Q may therefore be two facts and not literally one even if P -if-and-only-if- Q is a fact in the world's form (i.e., if ' P if and only if Q ' is analytic).

Third. What if P does not exist? More precisely, how can ' P ' MP be a fact if there is no fact for ' P ' to intend?¹² Once more, the answer depends on M being a subsistent. For P -or- Q to be a fact it suffices that either P exists or Q exists. This could not be so if *or* were not a subsistent but a relational universal, such as, say, being to the left of, which is a thing. This book being to the left of something else, for instance, is a fact only if that something else exists. Not so, we just saw, for *or*. As for *or*, so for M . (In my world a fact that isn't there yet exists, though only in the *mode of possibility*, which is of course the lowest ontological status of all. I call such "nonexistent" facts *p*-facts.¹² Nor is that an *ad hoc* construction. But I cannot here pursue this matter.)

Succinct as it is, almost desperately so, this sketch of an ontology will do as a foil for what must be said about Frege before I can intelligently attend to what Dr. Egidi says about him, except that the sketch could not even serve this purpose without some indications as to the ontological assays of judgment and of truth which it implies.

A judgment is an act. It will keep out issues that can be kept out of this essay without prejudging anything that will have to be said if we take it for granted that the species "in" an act of judgment is believing. That makes for a threefold distinction:

(α) P ' P ' $G(P)$.

P is the fact intended. ' P ' is the thought "in" the judgment. $G(P)$ is the judgment itself. P is never a constituent of $G(P)$. If P is nonmental, which is the only case we need consider, that is obvious. ' P ' is merely one constituent of $G(P)$. The other two are the species believing and the awareness which "individuates" the act, e.g., my judgment now that P , yours tomorrow, mine yesterday. 'Truth', or, rather, 'true' has

und Gegenstand" which is there quoted (p. 46 of the Black-Geach translation). Structurally the deepest root of this failure is that in his world there are no facts (complexes). See below.

¹² P obviously exists or doesn't exist depending on whether the sentence ' P ' is true or false. It is by now equally obvious, I trust, why at this point I avoid 'true' and 'false'. The root of all matters philosophical, including logic, is ontology.

(at least) four uses; one is primary; the second derives from the first; the third from the second; the fourth from the third.

In the *primary* use, 'true' and 'false' are predicated of thoughts, which are characters. A character is true if and only if there is an entity such that the character means (M) it and it is a fact. A character is false if and only if there is an entity such that the character means it and its negation¹³ is a fact. This assay has two consequences. First. *True and false, as represented by the primary use of 'true' and 'false', are subsistents.* More specifically, they are subsistents of the kind some call defined logical characters.¹⁴ Other entities of this kind are the integers, integer itself, transitivity, reflexivity, and so on. *Subsistents are neither mental nor nonmental.* Second. (1) ' P ' being true and (2) P itself are two facts, not one. That is again obvious, if only because (1) does while (2) does not contain the constituent ' P '. Nor is it a source of difficulties that the sentence ' P is true if and only if P ' is analytic. Just remember the hint of which it was said a moment ago that it would come in handy soon.

In their *secondary* use, 'true' and 'false' are predicated of judgments. A judgment is true (false) if and only if the thought "in" it is true (false).

An assertion is a kind of linguistic gesture. Typically, it involves the utterance of a sentence. Typically, it communicates a judgment of the one who makes the assertion. In their *tertiary* use, 'true' and 'false' are predicated of assertions. An assertion is true (false) if and only if the judgment it communicates is true (false).

The sentence involved in an assertion represents the fact the judgment communicated intends. What a sentence of a natural language represents depends on the context in which it is uttered. This is not so for the schemata called ideal languages. The fact represented by a sentence of an ideal language (*Begriffsschrift*) is completely determined by the sentence itself.¹⁵ In their *fourth* use, 'true' and 'false' are predicated

¹³ Negation being a subsistent, ' P ' and 'not- P ' both represent entities, one a fact, one a *p*-fact.

¹⁴ 'Defined' suggests complexity. If one holds, as I do, that among subsistents the dichotomy simple-complex makes no sense, then the word is misleading. So, since characters are things, is 'character'.

¹⁵ To realize the dependence of natural languages on context, consider (1) 'It is cold today' and (2) 'I am cold'. What (1) represents depends on when and where it is asserted; what (2) represents, on when and by whom it is asserted. The independence, in this sense, of schemata called ideal languages is one of the radical differences between them and natural languages. Because of this difference, those schemata could not even in principle be used for communication. Also, this difference unpacks part of the metaphor that an ideal language is, or purports to be, a picture of the world.

of the sentences of ideal languages. Such a sentence is true (false) if and only if what it represents is a fact (p -fact).

II

Some of the terms Frege chose are very awkward. Probably he sought for words to serve him as weapons in his life-long struggle against psychologism. For instance, he calls "thoughts" entities which he himself strenuously insists are nonmental and which one would therefore much rather call the (potential) intentions of thoughts (or of judgments, or of acts in general). Under the circumstances I shall continue to use my own words with the meanings I have given to them, make a special point of avoiding his use of 'thought'. It will be convenient, though, occasionally to replace 'mental-nonmental' by 'subjective-objective', which is the dichotomy he happened to prefer, probably because he felt that it stressed his opposition to psychologism.

Begriffsschrift appeared shortly before 1880, *Function und Begriff*, *Ueber Sinn und Bedeutung*, and *Ueber Begriff und Gegenstand* shortly after 1890. The three later essays present an explicit and rather detailed ontology of the objective (truncated) world. About minds as such they tell us nothing. They merely specify the objective entities which are the (potential) intentions of subjective acts. Nor does the earlier essay contain an ontology of mind. Yet it makes in §2 an important contribution to the ontology of judgment. To this contribution, as far as I know, none of Frege's later writings adds anything. Some even blur it. Perhaps that is why that early contribution has been somewhat neglected. It is a great merit of Dr. Egidi to have called attention to it. I shall next describe this partial ontology of judgment, then the eventual ontology of the objective world.

The heart of §2 is a distinction among three entities, represented by

(β) $P, \quad -P, \quad \vdash P,$

respectively. If you compare (β) with (α) above, you will be able to guess what I take to be the natural reading of the paragraph. $\vdash P$ is the judgment, the entity I call $G(P)$; $-P$ is the entity I call 1P , i.e., the thought "in" the judgment; P is its intention, or, as Frege here calls it, its "content." A string of six comments will support this reading and prepare the ground for what follows.

1. Frege here says nothing about whether P is simple or complex. Nor does anything he says depend on that. This is not to deny, though, that in his eventual ontology (of the objective world) all (potential)

intentions are simple. 2. $-P$ is called a "complex of ideas" (F2).¹⁶ That shows three things. (a) $-P$ is a mental entity. (b) Frege had not yet hypostatized thoughts into objective entities to serve as the intentions of judgments. (c) Verbally at least, he was still not completely free from the tradition that makes thoughts complex. 3. $-P$ is not the judgment itself but, rather, that constituent of it which also occurs in an act of merely entertaining P without either believing or disbelieving it. That shows that $-P$ is 1P . 4. Of the horizontal stroke in $-P$ it is said that it "combines the symbols following into a whole" (F2). Literally that does not make sense. For one, the symbols of a well-formed sentence are a whole. Thus the stroke would be redundant. For another, this whole is a nonmental entity. The only way of making sense out of the passage is to read it, with Dr. Egidi, as an assertion of the unity of thought. So read, it far outweighs the evidence to the contrary from 2(c). Or so at least it seems to me. One must not forget after all how very difficult it was in 1879 to speak about these things accurately. Nor is it very easy today. 5. Even though Frege insists that $-P$ is not the whole of $\vdash P$, he does not tell us what else there is "in" $\vdash P$. *At this place he leaves a blank. Eventually the blank will become a blur.* 6. P and $-P$ are two entities, not one. Nor is there anything to indicate that P is "in" $-P$. That shows that *the contribution is realistic*₂, or, at least, that it is compatible with realism₂.

In the eventual ontology (of the objective world) each entity is of one of two kinds. It is either a *Gegenstand* or a *Function*. The former are "independent" in exactly the same sense in which (in my world) things are. That makes them *things*. Frege's notion of function is mathematical. A function projects or maps one thing (or an ordered pair of things, etc.) on another thing. That makes a function "dependent" on the things mapped and mapped upon in exactly the same sense in which (in my world) the subsistents called ties are "dependent" on the things (and facts) they tie into complexes. Nor does a function need a further tie to tie it to what it maps and maps upon. That makes functions *syncategorematic entities*.

Things are of three kinds. The only members of the *first kind* are the two truth values, the thing True (T) and the thing False (F). The things of the *second kind* are all "senses," e.g., the sense-*that*-Peter-is-blond, the sense-*of*-Caesar, the sense-*of*-Calpurnia's-husband. Judgment is propositional, of course. Hence, only the senses whose names contain 'that' are the (potential) intentions of judgments. But Frege is

¹⁶ "F2" refers to page 2 of the Black-Geach translation. But I have the German text of *Begriffsschrift* before me. 'Complex of ideas' stands for '*Ideenverbindung*'.

not (as far as I know) committed to the view (which happens to be mine) that all awareness is propositional. Thus the senses whose names contain 'of' could be and probably are in his world the (potential) intentions of other acts, e.g., of perception. *All possible senses exist.*¹⁷ The things of the *third kind* are either ordinary "things" such as Peter or Mary or a colored spot; or they are integers, classes, and so on. For our purposes it will be safe to ignore all but the "ordinary" members of this kind. (The quotation marks around 'thing' are a reminder that in my world a colored spot is a fact, just as numbers are subsistents of the kind some call defined logical characters.)

Functions are of two kinds. One is exemplified by blond, tall, and so on.¹⁸ Frege calls them concepts (*Begriffe*), but we can do without this word. The other kind is exemplified by the connectives, i.e., by the entities represented by 'and', 'or', 'if-then', and so on. The connectives map (ordered pairs of) truth values on truth values. The other kind of function maps ordinary things (or ordered pairs of such, etc.) on truth values. Blond, for instance, maps the thing Peter on either the thing T or the thing F depending on whether Peter is or is not blond.

Blond and tall being universals, this is the proper place for saying what little needs to be said about Frege's "hidden nominalism." Since his universals have ontological status in the objective world, he is not a dead-end nominalist. On the other hand, since his universals are functions and functions are "merely" subsistents (syncategorematic entities), his nominalistic tendency is as pronounced as it could be, stops just one step short of the dead end. A comment may add perspective. The ontological status of the connectives is very "weak," so weak indeed that the reists either overlooked it or quite explicitly insisted that they had none. Frege recognized that they have some. That is one of his glories. On the other hand, he depressed the ontological status of universals by lumping them with the connectives. That is one of his fatal errors.

Are Frege's things all simple or are some of them complex? We are not told; as far as I know, he ignores this fundamental dichotomy. Structurally, that is perhaps the most striking feature of his ontology. As far as I know, his is indeed the only articulate ontology of this kind.

¹⁷ I.e., if the dots in 'sense-that- . . . ' are replaced by a well-formed sentence, the resulting expression is the name of a thing that exists. Similarly for 'sense-of- . . . '. 'Sense' stands of course for Frege's '*Sinn*'.

¹⁸ Or, more accurately and in the spirit of the system, being-blond, being-tall. But I permit myself this simplification, just as I ignore, safely for the purposes of this essay, the problem of the appropriate ranges (domain and counter-domain) of functions, which is of such crucial importance in the foundations of arithmetic.

The only way, therefore, of arriving at an answer is to infer it from the structure of what we are told. Presently I shall propose an answer. *Frege's things are all simple.* First, though, I shall explain why the dichotomy is so fundamental that one cannot thoroughly discuss his ontology without answering the question.

Remember what was said earlier. The world is not just a class or collection of disjointed entities; it is completely structured. I say and mean the world as a whole. But we may once more focus on the objective world. To account for the world's structure is an obvious task or problem every adequate ontology must solve. Recognizing a task and tackling it in a certain way or style is one thing. The adequacy of a solution proposed is another thing. Consider a world (ontology) all whose things are simples and all whose complexes are facts. That merely brushes aside details. In such a world one may try to solve the task by making things (simples) constituents of facts (complexes) which are in turn constituents of other (more complex) facts. This is a style. As it happens, it is *the* style of virtually all articulate ontologies. The key to it is the dichotomy simple-complex. That shows why the dichotomy is so fundamental. This is one thing. That a reistic ontologist cannot in this style arrive at an adequate solution is another thing.

Let us check how the prevailing style works in my world. Assume for the sake of the argument that Peter and blond are simples. Consider Peter's being blond. Four entities are involved: (1) the simple thing (individual) Peter, (2) the simple thing (character) blond, (3) the subsistent called exemplification, (4) the fact of Peter's being blond. (4) is the complex which exists because (3) "connects" (1) and (2); thus making (1), (2), and (3) constituents of (4). The world of my ontology is completely structured.

There are two reasons for holding that Frege's things are all simple. One of them I am not yet ready to state. The other is as follows. Frege recognized the need for subsistents. That makes it more than plausible that he also recognized that there cannot be complexes unless there are some subsistent ties which make complexes out of simples. Yet none of his subsistents is a tie; they are all functions; and a function, rather than making a complex out of, say, two things, maps one of them upon the other.

I take it, then, that Frege's things are all simple. It does not follow that his (objective) world is completely unstructured. His functions do establish "connections." Not to recognize that is to miss the very point of their having ontological status. On the other hand, since functions do not make complexes, these "connections" are not, as I use the word, facts. *In Frege's world there are no facts.* It may help, though, if

occasionally we speak and think of his "connections" as "facts." (This is a recognition of, as well as an attempt to overcome, the difficulty of speaking without distortion about a style radically different from one's own.)

In Frege's world Peter's being blond involves at least four entities; (1) the thing Peter; (2) the thing T; or, if Peter is not blond, the thing F, but the difference makes no difference for what we are about; (3) the function blond; (4) the thing sense-that-Peter-is-blond. (5) maps (1) on (2). That is the "fact" in the case, which itself is not an entity. (1) and (2) are nevertheless objectively "connected" by (3). There is, however, no objective "connection" whatsoever between (4) on the one hand and (1), (2), (3), on the other. That shows that *Frege's world is not completely structured*.

One may try to remedy the defect by bringing in two more things, namely, (5) the sense-of-Peter and (6) the sense-of-(being)-blond. (6) is the sense of a function. Are there in Frege's world such senses? Whatever expedients either he himself or his disciples may have resorted to, structurally, I believe, the answer is No. But we need not insist, may even for the sake of the argument assume that there are such senses. If so, then (4) will be "connected" with (1), (2), (3) if and only if the following two conditions (a) and (b) are fulfilled. (a) (5) and (6) are constituents of (4). (b) (5) and (6) are "connected" with (1) and (3), respectively. (a) makes (4) a complex. Hence, if all things are simple, the attempt at remedying the defect fails on this ground alone. But let us waive that argument, look at the first half of (b), i.e., at the two things Peter and sense-of-Peter. There is no objective "connection" whatsoever between them. To appreciate the gravity of the point, introduce two more things, Mary and the sense-of-Mary. There is no "connection" between any two of these four things. What, then, one must ask, is the objective "fact" that makes the sense-of-Peter the sense of Peter rather than that of Mary and conversely? I conclude that the things Frege calls *senses are totally disjointed from all other entities of his objective world*. Nor is that surprising. Senses, after all, are merely the (objective) hypostatizations of (subjective) thoughts.¹⁹

Assume next, for the sake of the argument, that there is an objective "connection" between (4) on the one hand and at least one of the entities (1), (2), (3) on the other. The only likely candidate is (2), the thing T. Assume, then, contrary to fact, that there is an objective

¹⁹ The two major dialectical motives for this hypostatization are Frege's anti-psychologism and his awareness of the logical problem of intentionality. See fns. 9 and 11.

"connection" between (4) and (2), i.e., between the sense-that-Peter-is-blond and T. If this were so, since (1), (2), (3) are "connected," (4) would over (2) also be connected with (1) and (3) and this world would in its own peculiar way be completely structured. To appreciate how peculiar that way would be, consider that, if Mary is tall, the "connection" among the three entities Peter, blond, and the sense-that-Peter-is-blond would be exactly the same as that between the three entities Peter, blond, and the sense-that-Mary-is-tall. One could argue that such a "connection" is worse than none. That shows the absurdity of hypostatizing the two subsistents true and false into the two things T and F.

Virtually all studies of Frege start from and are dominated by his *semantics*. I deliberately stated his ontology without any reference to his semantics. This is not to deny the crucial importance of the linguistic turn or even of ideal languages. Their importance, though, is methodological. Once one has either by this or by any other method enucleated an ontology, either his own or another's, he will be well advised to check his result by trying to state it without even mentioning words. Otherwise he will be in danger of mistaking for ontology what is merely semantics. In Frege's case, he may mistake for objective a "connection" which is merely semantical and therefore in the relevant sense subjective even though words as such and the ways we use them are of course "objective" facts of the world "as a whole." Or is it not obvious that an objective "connection" between objective things does not depend on whether or how we or any one else talks about them? What if there is no one at all to talk about them or, for that matter, about anything else? Isn't that just another bit of realistic, common sense?

In Frege's semantics 'Peter' and 'Peter is blond' are expressions of the kind he calls saturated. Every saturated expression has a double semantical tie, one to the thing called its sense (*Sinn*), one to the thing called its reference (*Bedeutung*). The sense and the reference of 'Peter' are the sense-of-Peter and Peter; those of 'Peter is blond' the sense-that-Peter-is-blond and the thing T, respectively. In this way the two things Peter and sense-of-Peter are linked semantically. So are the two things T and the sense-that-Peter-is-blond. Thus, if a semantical link were what of course it is not, namely, an objective "connection," Frege's objective world would be completely structured.

Words are objective (nonmental); judgments are subjective (mental). Yet the former are used to express the latter. There is a cue here. Following it, we shall discover that there is in Frege's world as a whole

a mental "connection" between such nonmental things as, say, T and the sense-that-*P* even though in his objective world these two things remain totally disjointed.

Sinn und Bedeutung contains two crucial passages²⁰ (F65, F78) to the effect that a judgment is the "advance" from a sense-that to "its" truth value. I do not quote the passages only because I continue to use my own words. 'Advance' and 'its', though, are Frege's. They leave no doubt that the advance is held to provide a mental link between such nonmental things as, say, T and the sense-that-*P*. Thus, the "connection" established is at best subjective. Unfortunately, though, the very idea of this advance is irremediably confused. Frege himself was not wholly at ease. Otherwise he would not have warned (F65) against mistaking the italicized formula for a definition. The formula is nevertheless the heart of his irremediably confused eventual ontology of judgment. *The blank of the early contribution has become a blur.* I shall remove the blur by stating the only clear idea of an "advance" in this context.

Suppose that three acts occur successively in my mind. The species of the first is entertaining (without either believing or disbelieving); the species of the second is perceiving; that of the third, believing. The intention of all three is the same, *P*. The thought "in" all three is the same, '*P*'. That is merely a schema of course, but it will serve. One starts by entertaining *P*; one ends by judging that *P* (believing that *P*). Or is there any other way of "advancing" toward a judgment? In the schema, the "advance" is from an entertaining through a perceiving to a believing; the thoughts and the intentions of the three acts happen to be the same. I say happen partly because not all "advances" are that simple; partly because I want to repeat that even if there were such objective things as the sense-that-*P* and T and even if these two things were the intentions of the first and the third act, respectively, the "connection" which the "advance" establishes between these two objective things would still be subjective. Nor, alas, is that all. T is a thing. Thus it could not in Frege's world be the intention of a judgment. That alone shows that the confusion is irremediable. Notice, too, that unless a judgment has actually occurred, there is no actual but at most a possible "connection."

Since some of its things are totally disjointed from all others, Frege's truncated world is not completely structured. If, however, one follows him in adding to the (nonmental) "connections" available in this world some

²⁰ Characteristically, they are also crucial for the problem, from which the whole essay is developed, of how, if 'a' and 'b' are both "names," 'a = a' and 'a = b' can differ in "cognitive value." See also below.

others which are mental and therefore not available at all unless there are minds, then, after a fashion at least, his truncated world becomes completely structured. (I say after a fashion because of the blur.) This is the diagnosis at which we have arrived. It suffices to identify the idealistic tendency in Frege's ontology. But it will be better if we postpone this job, turn first to some comments that will support and round out what has been said so far.

The early contribution to the ontology of judgment, although sound, was yet fragmentary. Eventually the blank became a blur. Can one so fill this blank that Frege's world as a whole becomes completely structured? Since he tells us but very little about minds as such, the question is rather moot. Yet the answer may, and I believe does, yield some dialectical insight. My answer has two parts. 1. As we just saw, one would have to make truth values intentions and admit merely possible "connections." Both emendations are antistructural. (This is but another way of saying that the confusion requiring them is irremediable.) 2. Remember the problem of false belief. Since the intentions of *some* acts do not exist, the "connection" between *any* act and its intention cannot be a relation. In my world the difficulty is solved by making it a subsistent (*M*). Frege has no difficulty. All possible senses exist. Thus one could fill the blank by making minds things which are "connected" with their intentions by relations. Or, to say the same thing in Frege's style, one could add to his world things which are minds and an appropriate class of binary functions. The modified Frege-world which is the result of this addition and of the counterstructural emendation is indeed completely structured. Yet it has three peculiar features. (a) Certain "connections" among objective things remain as subjective as before. (b) If I judge that *P* then, irrespectively of whether my belief is true or false, the believing-function maps my mind and the thing T on T. That makes it embarrassingly clear that the judgment as such is completely disjointed from the sense, even though one may have "advanced" to the former from entertaining the latter. 3. If acts are relational, then the mental entity the early Frege called *-P* has no place in the system. Thus a further emendation is required. We must abandon a most valuable part of the early contribution.²¹

²¹ All this is further evidence that senses are but hypostatized thoughts. But there is here a striking dialectical connection with representative realism in the style of, say, Locke, which has been pointed out to me by E. B. Allaire. In those ontologies a mind is "connected" to that wholly mythical entity called a percept by a relation which corresponds structurally to one of the binary functions I added to Frege's world. The only difference is that while all Fregean intentions are nonmental, percepts are meant to be mental entities. The more striking it is

In Frege's semantics all sentences and all definite descriptions are *names*. 'Peter is blond', for instance, is a name of T or F, depending on whether Peter is or is not blond. 'Calpurnia's husband' is another name of Caesar.²² This is the second structural reason for holding that in Frege's ontology all things are simple. Since it is semantical and since, for a reason that has since been explained, I did not want to introduce Frege's semantics before having stated his ontology, I did not state this second reason when stating the first. Now I am ready.

Speaking as we ordinarily do, we use 'name' very broadly. In this century the philosophers who were most influenced by Frege used the word very technically. Their use, which is very narrow, carries more or less clearly three connotations. (1) A name represents a simple thing. (2) A name tells nothing about the entity it represents.²³ (3) In a well-constructed *Begriffsschrift* (ideal language) a name does not occur unless the entity it purports to represent exists. Had Frege himself always and clearly used 'name' with all these connotations, I would in view of (2) have made my point. I do not make so extreme a claim concerning Frege's use of the word. I merely claim that all these connotations are more or less clearly implicit in the way he uses it. Just remember how it puzzled him that ' $a=b$ ', where ' a ' and ' b ' are names, can convey any information.²⁴ Nor is it just chance that in the post-Fregean debate these connotations became ever more clear and explicit.

In my world, you will remember, P and ' P ' being true are two facts, not one. In Frege's world there are no facts. Literally, therefore, he cannot either agree or disagree. But he comes as close to disagreeing as he can by asserting (F64) that the sense-that- P and the sense-that- P -is-true are one thing, not two. We ought to be able to understand how he came to assert that. Let us see.

In his world there is only one kind of "fact." Something maps some-

that in spite of this difference the two worlds suffer from the same structural weakness. Just as the representative realist cannot bridge the gap between the subjective percept and the objective entity of which it is the percept, so the "connection" between a sense and what it is the sense of remains even in the modified Fregean world subjective.

²² According to Frege, a description that fails names the arithmetical thing Zero. In *Meaning and Necessity* Carnap, prone as always to mistake a mathematical construction for a philosophical idea, recently revived this infelicitous "stipulation."

²³ Except, by its shape, about the ontological kind (individual or character) to which it belongs. This, though, is another detail we may safely ignore.

²⁴ See fn. 20.

thing on something else. Blond mapping Peter on T is such a "fact." Call it α . ' P ' does not really state α ; it is merely a name of T. Let us express this by saying that ' P ' corresponds to α . The sentence corresponding to ' P ' being true is ' $P=T$ ', with '=' representing an identity function,²⁵ i.e., a binary function projecting two things on T if and only if the "two" are one. The identity function projecting P and T on T is a "fact." Call it β . Are α and β two or one? I am prepared to argue that by the logic of "facts" they are two. If you disagree I shall take your disagreement to show how very difficult it is to think and talk about a world without facts (not: "facts"!), particularly when one is committed to a schema whose sentences do not even state "facts" but are merely names of T or F. Fortunately we need not argue. For I also believe that Frege agreed with you, held α and β to be one. Thus, whether or not you agree with me that they are two, we can agree that he wanted to assert their being one. Moreover, it is obvious that he could not possibly assert that by asserting that ' P ' and ' $P=T$ ' both name T. For, that would imply that the two "facts" by virtue of which Peter is blond and Mary is tall also are one. So he asserts instead that the sense-that- P and the sense-that- P -is-true are one. That leads to two further observations.

First. If ' P ' is false, then it is a name of F while ' $P=F$ ' names T. Hence ' P ' and ' $P=F$ ' do not have the same sense. That shows that the symmetrical treatment of T and F is mere sham. Nor is that surprising, since T (but not F) does the job which in my world is done by exemplification and exemplification produces entities which are not merely in the mode of possibility.

Second. Consider the infinite series

$$(P = T), \quad (P = T) = T, \quad [(P = T) = T] = T, \dots,$$

all of whose members are well-formed, compare it with the familiar classical regress

$$\begin{aligned} & \text{I know } P, \quad \text{I know that I know } P, \\ & \text{I know that I know that I know } P, \dots; \end{aligned}$$

notice that in my schema the mark for the subsistent true cannot be iterated without adding corners

$$[P \text{ is }^1 \text{ true}, \quad [[P^1 \text{ is true}^1 \text{ is true}, \quad [[[P^1 \text{ is true}^1 \text{ is true}^1 \text{ is true}, \dots;]]]]]$$

²⁵ In *Begriffsschrift* identity holds between names, which makes even identity subjective. Eventually Frege introduces an objective identity function. Grossmann argues convincingly that this change occurred at the approximate time of the three great essays.

and you will see that T also does the job of that mental character which I call the species "in" an act of judgment. Or are we to infer that only a true judgment is ontologically a judgment, only a true belief a belief?

These observations show the absurdity of hypostatizing true and false into two objective things. The next paragraph is not strictly necessary in the context of this essay. Yet it is short and it at least states the answers to some questions that must have arisen in the mind of the reader. So I shall indulge in the digression.

In a schema that reflects a world like mine no compound expression is a name. A name is a primitive symbol that represents a simple thing. No simple thing has more than one name. Sameness and diversity themselves are not represented but merely "show themselves" by the sameness and diversity of (types of) expressions. (That shows, once more, that ideal languages are not really languages. Also, it unpacks part of the metaphor that they are pictures of their worlds.) Two things are identical and not one, or, as one says, the same, if and only if whatever can be said about the one also can *salva veritate* be said about the other (Leibnizian identity of indiscernibles). Identity is represented in the schema (Leibniz-Russell definition of identity). It is, however, a categorial feature of the *truncated* world that no two simples are identical. Two awarenesses, it seems, can be two and yet identical (discernibility of identicals). All this unpacks part of the aphorism that sameness and identity are primary. Notice, finally, that in Frege's case I spoke of an identity function, not of a sameness function. A sameness function would be a monadic function mapping every thing on itself.

Subjective idealists hold that only minds exist. Upon the commonsensical use of 'mental' and 'nonmental', which I shall not abandon, some things are mental, some are nonmental. That makes subjective idealism absurd. Objective idealists hold that all nonmental things are, in a very special sense of the word, "mental." The only way to find out what this very special sense is, is to state commonsensically those features or alleged features of the nonmental which are held to make it "mental." Thus one can discover the dialectical core of objective idealism. Its proponents may or may not add that the nonmental (the truncated world) is literally a Mind of which our own minds are "moments." That is merely speculation. So I merely ignore it. But I reject any ontology, with or without speculative accretions, whose dialectical core is absurd. *The dialectical core of objective idealism is the proposition that minds contribute (create) the structure of the nonmental.* That is absurd.

Frege's truncated world is not "mental." Nor does he claim that it is.

That makes him a realist₂. He is indeed one of the very few realists₂ whose truncated world is at least partly structured. That makes his realism sturdier than most others. For the inadequacy of reism creates a very strong pull toward idealism. That we saw when we discussed the interaction between the three centers of the basic dialectic. On the other hand, according to the diagnosis at which we arrived some time ago, *part* of the structure of his truncated world is contributed by mind. That makes his ontology idealistic in tendency.

Frege also hypostatized mental things (thoughts) into nonmental ones (senses). Does that make his ontology materialistic in tendency? A materialist either denies that there are mental things, which is absurd, or, which is equally absurd, he "identifies" them with "ordinary" nonmental things. Frege's T and F and his senses are, alas, most "extraordinary" nonmental things. That is why they do not make him a materialist. Rather, they testify to the tenacity with which he clung to his realism₂ under dialectical pressures to which no one before him had been as sensitive as he was.

III

Dr. Egidi is exquisitely sensitive to the pressures from the three centers of the basic dialectic. Her strongest and clearest commitment is to the unity of thought. In her own way she insists on the inadequacy of reism. She is aware of the problem of adequation. This is her profundity. She sees no realistic₂ way of resolving the basic dialectic. That is why, under the pressure of her strongest commitment, she opts for objective idealism. But she not only makes a choice, she also makes a claim. Structurally, she claims, Frege is an objective idealist. Not surprisingly, the argument or reasons by which she supports her claim depend on those by which she supports her choice. That is why before examining the former I shall examine the latter. The conclusion at which I shall arrive is that none of her arguments, either for the choice or for the claim, is a good argument.²⁶

Dr. Egidi believes, with one qualification, that one must choose between Aristotelianism and objective idealism. The qualification concerns those who see through the inadequacy of Aristotelianism, yet persist in rejecting objective idealism. These, she believes, are forced to withdraw into the desert of dead-end nominalism. Since she also

²⁶ Notice once more the heavy emphasis on the dialectic. I need not and do not claim that her ontology is "false" or that her reading of Frege is "mistaken." I merely claim that the reasons or arguments she gives for them are not good reasons. This is just one of the many lessons I have learned from G. E. Moore.

seems to believe that I am among the dwellers in this desert, I shall try to convince her that I am not by showing first of all what is or ought to be obvious, namely, that dead-end nominalism is not a way out of the impasse of reism.

Realists₁ hold that "in" Peter's being blond there are two things, Peter and blond. Reistic realism₁ fails because it cannot "connect" the two. Dead-end nominalists find "in" this fact only one thing, namely, Peter. Hence, if they could otherwise solve the problem of universals, i.e., if they could assign an ontological ground to Peter's and Mary's both being blond, they would not at this point have to face the problem no reist can solve. Yet they would be up against it at the very next step. What "connects" the several facts of their world? Since they are all reists, any two facts (or should I say things?) remain disjointed. That shows that the only way out of the impasse of reism is not dead-end nominalism but, rather, the recognition of the ontological status of a class of subsistents sufficient not only to make realism₁ viable but also to account for a world that is completely structured.

Aristotle's individuals are substances; his characters, attributes.²⁷ The former "create" or "produce" the latter, the latter "inhere" in the former. The traditional words ('create', 'produce', 'inhere') suggest a characteristic feature. Attributes "depend" on substances in a sense in which the latter do not "depend" on the former. That spots a nominalistic tendency. On the other hand, Aristotle's substances and attributes are both things. Any one who does not use the word as narrowly as I sometimes do will therefore call him a "realist₁." Nor is it fair to call him a reist. "Inherence" or, conversely, "creation" is a sort of tie. The trouble is that closer analysis reveals it to be irremediably anthropomorphic. This is the fatal flaw not just of Aristotelianism but of all substantialist ontologies.²⁸

Dr. Egidi identifies Aristotelianism (substantialism) not only with realism₁ but also with reism. More fatally still, since Aristotle is of course a realist₂ and since she sees in him the only alternative to either objective idealism or the nominalist desert, she identifies realism₁ and realism₂. Thus she fails to distinguish between any two of four things as different from each other as Aristotelianism (substantialism), realism₁, realism₂, and reism. This is her *first major mistake*. It vitiates all her arguments.

²⁷ For our purposes it is safe to ignore the distinction between attributes and accidents.

²⁸ This shows how the issue of bare particulars versus substances ties into the basic dialectic.

Aristotle, like Frege, was not only an ontologist but also a logician. That makes it convenient to introduce next some distinctions Dr. Egidi misses in the area of logic, even though this second failure affects the arguments for her claim more than those for her choice. First, though, I must delineate a subarea of this area on which we completely agree.

Logic without ontology is merely a calculus. A calculus acquires philosophical import only if its author claims that it is an ideal language (*Begriffsschrift*), i.e., that it perspicuously reflects an adequate ontology. I shall mark this distinction by consistently so using the two words that 'calculus' stands for what is merely a calculus, 'logic' for a calculus to which that claim has been attached. Ordinary grammar or language, although we cannot but start from it, is not a reliable guide to logic. Our (Indogermanic) languages are all of the subject-predicate form. Aristotle's logic more or less perspicuously reflects his ontology. His calculus is an *exaggerated subject-predicate calculus*, i.e., it hugs the subject-predicate form of ordinary grammar so closely that it reflects (rather perspicuously) certain specific inadequacies of his ontology. The subject of 'Peter loves Mary' is 'Peter'; that of 'Mary is loved by Peter' is Mary. In an exaggerated subject-predicate calculus that is an important difference. Yet there is an important sense of 'same' in which both sentences represent the same fact.²⁹ 'Loves Mary' in 'Peter loves Mary' is construed as is 'is red' in 'This is red'. That reflects an inadequate ontological assay of relations. The transcription of 'All dogs are mammals' into the calculus preserves the subject-predicate form. That reflects an inadequate ontological assay of generality. And so on. (Ordinary language is not an exaggerated subject-predicate calculus simply because it is not a calculus. That is why on the one hand it is flexible enough to represent everything while, on the other, there is much which it does not represent perspicuously.)

It is a great merit of Dr. Egidi to have seen all this very clearly, more clearly indeed than many in whose ambience these insights are more widely spread than in hers. As far as I know, she is also right in insisting that Frege was the first who saw all this; and I share her admiration for his momentous achievement. There, though, our agreement ends.

A calculus may be a *moderate subject-predicate calculus*, i.e., it may be of the subject-predicate form without hugging this form so closely that any ontology it perspicuously reflects must suffer from those specific

²⁹ 'Peter loves Mary if and only if Mary is loved by Peter' is analytic. But we need not at this point commit ourselves as to whether the-thought-that-Peter-loves-Mary and the-thought-that-Mary-is-loved-by-Peter are two things or one.

inadequacies with respect to relations, generality, and so on, which mar Aristotle's. I am not sure that Dr. Egidi disagrees. But I am very sure, alas, that she believes any such calculus to be inadequate in an even more radical sense. According to her, any ontology perspicuously reflected by a moderate subject-predicate calculus must be reistic. This is her *second major mistake*. Four comments will show how bad a mistake it is and at the same time prepare the ground for the third major criticism.

1. *Principia Mathematica* (PM) is a moderate subject-predicate calculus. Yet it can be used and in fact has been used for the correction of those specific inadequacies of the Aristotelian ontology. 2. Notice the condition of perspicuous reflection. To unpack this label is a very major job. Also, the matter is very technical. If one understands it completely, then he sees that a calculus which perspicuously reflects a (non-reistic!) world whose fundamental tie is exemplification must be a moderate subject-predicate calculus and conversely. This is not to say that all philosophers who propounded a PM-type logic realized that the syncategormatic entities exist. But, then, neither did they fully understand those very technical matters. (3. Presently we shall see that in all calculational respects Frege's logic is a moderate subject-predicate calculus. Its perspicuity is a different matter. That we have seen already.) 4. I believe, first, that the logic of the truncated world is of the PM-type. I believe, second, that the logic of our world as a whole, that is, including minds, is not of this type. Or, to say the same thing in a way that suits our purpose, while such a calculus can be used to represent perspicuously all nonmental intentions, it contains no means for so representing either the subsistent I call *M* or the simple characters I call thoughts (1P) or the facts called acts and, in particular, judgments ($G(P)$). (This fits nicely with the materialistic (behavioristic) tendencies of most "PM-philosophers.")

Peter's being blond (P) is *one* fact. Your or his or my judging that Peter is blond ($G(P)$) is *another* fact.³⁰ Dr. Egidi would not put it this way, yet she would agree. She also holds that a calculus may perspicuously represent one of the two facts, namely, P , without so representing

³⁰ If the first fact is represented by ' P ', then the second is in my world represented by ' a is believing and a is 1P ', where 1P is a simple character and a the individual "in" the act. Thus, the first fact is not upon this assay a constituent of the second, the "connection" between the two being accounted for by the analyticity of ${}^4P^1MP$. Of the third, formal fact represented by the latter sentence both P and 1P are constituents.

the other, namely, $G(P)$. With this I agree. This is indeed the very point of what I just said. A PM-type calculus can be used to represent perspicuously every nonmental intention but contains no means for so representing $G(P)$. There, though, our agreement ends.

Dr. Egidi holds that no calculus can perspicuously represent the act of judging. Any logic for which this claim is made (as I make it for mine) she calls "formalistic." The idea is that no formalistic logic can perspicuously represent an adequate ontology. This is her *third major mistake*. Some of my reasons for judging it to be a mistake may be merely implicit in Sections One and Two. Most of these reasons, though, are quite explicit in what has been said so far. Repetition is tedious on any occasion. Complete explicitness is not practical on this occasion. So I shall next show that the intellectual motive behind the mistake is structural idealism.

Dr. Egidi's ontological assay of judgment is idealistic. According to such an assay, the mind first "posits" what, after having posited it, it judges. To posit something, in this sense of the word, is to create or produce it; or, at least, to "contribute" to the "product" something without which it would not be what it is. That makes the idealistic assay of judgment the structural heart of idealism. Thus, if she will permit me to say so, Dr. Egidi shows even in some of her mistakes the flair of those who can think structurally. Rightly or wrongly, she goes to the heart of the matter.

To connect this diagnosis with what she actually says, turn to CLFC 203-205. Rather than quote, I shall express her ideas in my own words. Without the unitary act, she holds, there would not be that manifold which is such a striking feature of its (nonmental) intention. Logic (language) can only represent the manifold which is, wholly or in part, the product. It cannot represent the producing. Or, to say the same thing differently, language (logic) can only represent what we know. It cannot represent the "ideal conditions" which make it "possible" for us to know what we know.³¹ That shows beyond doubt that the intellectual motive behind Dr. Egidi's third major mistake is the structural core of idealism.

That much for her choice. I now turn to her claim.

Her claim stands or falls with her contention that Frege's ontology of judgment is structurally idealistic, i.e., that implicitly at least it agrees with hers. The main evidence she has so far produced for this

³¹ I am of course aware of the Kantian flavor of this 'possible'. Dr. Egidi would not, I think, repudiate the structural connection thus hinted at.

contention is what is said about judgment in the *Begriffsschrift*, particularly in §2. Let me once more draw a clear line between agreement and disagreement. She gives Frege credit for distinguishing between $\vdash P$ and $-P$, i.e., between a judgment and what I call the thought "in" it. If you recall what has been said about that early contribution in Section Two, then you will see that I agreed. She takes what Frege says in §2 to be an assertion of the unity of thought. I agreed that he may plausibly be credited with this fundamental insight. There, though, our agreement ends. For I also believe to have shown three things which are incompatible with her contention. First. The natural reading of §2 is realistic₂. Second. This early contribution to the ontology of judgment is fragmentary; it leaves a blank. Third. Eventually the blank becomes a blur. Frege's idea of judgment as an "advance" from a sense to a truth value is irremediably blurred.

Dr. Egidi takes advantage of the blur by filling the blank with her own idealistic ontology of judgment. In this she shows once more her keen sense of structure. For the blur is indeed the seat of the idealistic tendency of the system. If you want to verify this diagnosis, turn to MLFF 19, where she says perhaps most bluntly what more subtly she intimates again and again, namely, that a Fregean "advance" is really a Fichtean "posit."³² It does not follow, alas, that her claim is sound. Frege's T and F and his senses are most "extraordinary" things indeed. So are his functions, even though to a mathematician bent above all on refuting psychologism that may not have been as obvious as it really is. Yet all these entities are clearly nonmental. For one, Frege himself, as far as I know, has never claimed them to be either mental or "mental." For another, irrespective of what he himself may or may not have said or believed, they all are structurally nonmental. That is indeed the argument of Section Two. So I shall without repeating myself conclude this examination by attending to two of Dr. Egidi's arguments for her claim, both of which I find rather disappointing.

Are functions and ordinary things, say, blond and Peter, "determinate" entities "independent" of the acts which posit them? The two words between double quotes are hers, not mine. Yet there is no doubt what the question means. Are these entities objective or nonmental in my (and, if I am right, Frege's) sense? Dr. Egidi consistently denies that they are. Functions in particular she calls "ideal" entities in the

³² Idealistic ideas are not easily explicated by means of a calculus; not, alas, because Dr. Egidi is right but, rather, because they are so vague and elusive. If I were to try, though, I would say that according to Dr. Egidi the mind in its advance "posits" the identity $(\vdash P) = T$. I merely add that while $\vdash (P = T)$ is at least well-formed, $(\vdash P) = T$ is ill-formed in the Fregean calculus!

sense that they make "experience" possible. She also calls them "objective." But then it transpires (CLLF 207) that all she means by that is that the experience they make "possible" is independent of its linguistic representation in exactly the same sense in which a certain fact that was mentioned earlier is independent of its being represented by either 'Peter loves Mary' or 'Mary is loved by Peter'. This I find disappointing.

Frege, like his successor Russell and like Russell's successors, writes ' $f(x)$ ', ' $r(x y)$ ', and so on. The only difference is in the semantics. For Russell, the substitution instances of ' $f(x)$ ' represent facts or possible facts; for Frege, they are names of either T or F. And so on. That makes it obvious that *in all calculational respects* Frege's logic is a moderate subject-predicate calculus. But it will help if before turning to the second argument I state the two qualifications which are covered by the italicized phrase. (a) On the one hand, the assertion sign (\vdash) and the horizontal stroke ($-$) do not fit into a moderate subject-predicate calculus. On the other hand, Frege himself makes no real calculational use of them. That is why the later logicians were puzzled by them and eventually dropped them, which in turn fits well with what Dr. Egidi and I agree upon, namely, that Frege in §2 introduced the two signs in order to make by means of them a point in the ontology of judgment. (b) 'T' and 'F' do not fit into a moderate subject-predicate calculus. More precisely, if they are taken to represent things, then ' $P = T$ ' and ' $P = F$ ' are in such a calculus ill-formed. But then, as far as I know, neither Frege nor, with the possible exception of Alonzo Church, any of his followers have paid any attention to these two expressions. Rather, it was I, who, for a purpose of my own, insisted that they are, or, at least, that they ought to be considered as well-formed. My purpose, or, rather, the use to which I put them in Section Two, was to expose by means of them some of the perplexities of Frege's ontology as well as the lack of perspicuity with which it is reflected by his calculus.

Dr. Egidi makes much of the fact that in dealing with the sentential calculus the Frege of the *Begriffsschrift* uses sentential variables, writing ' p ' instead of, say ' $f(x)$ '. This she takes to be *his* assertion of the unity of thought, upon which she foists *her* ontology of judgment. The truth of the matter is that no mathematician of even the most moderate skill who had either conceived or been told the idea of the sentential calculus would in constructing it use any but sentential variables. Sentential logic is the most fundamental part of logic. To have recognized that is without doubt one of Frege's major achievements. But it is disappointing to see Dr. Egidi build so much of her argument on the

trivial fact that he writes the sentential calculus in sentential notation. Besides, if it were the job of the single variable to express the unity of thought, may I ask how she would explain what she also asserts, namely, that the same job is also done by the horizontal stroke?

The indictment I have drawn up against Dr. Egidi is severe. Yet I do not want to end on a note of disappointment. So I shall change sides, from the prosecution to the defense, as it were, and conclude with some remarks which will add perspective in a way that amounts to a plea of attenuating circumstances.

The basic dialectic of the realism-idealism issue lurks in the things themselves. The trend toward idealism began only about three hundred years ago, that is, roughly, at the time of the Cartesian revolution. Why did this trend start at just that time? The gist of what I believe to be the right answer can be stated very briefly.³³ The Aristotelian-Thomistic account of perception, which was dominant until then, is realistic₂ in structure. A single substantial form informs the mind of the perceiver and the thing perceived. This account was supported by and is compatible with the idea that a mind can only know what is "in" it. The revolution overthrew the old account of perception. The idea continued to be taken for granted. That suffices to account for the rise of the trend.

The lure of idealism continues undiminished. The structure of Deweyan instrumentalism is idealistic.³⁴ The same is true of the present misery, at Oxford and elsewhere, which goes by the name of ordinary-language philosophy. If the temptation of a philosophy so absurd continues so strong for so long, it stands to reason that, for all its absurdity and even though at a prohibitive price, it accounts more adequately than its competitors for at least one striking feature of the world. The thing to do, therefore, is to identify this feature and try to do justice to it in a realistic₂ ontology. Then and only then will the temptation cease.

The role of minds in the world is unique. This is the feature. The idealists' way of safeguarding it is to insist, with or without some attenuation, that minds "create" their intentions, which is absurd. My way of safeguarding it is different.

Consider (1) '*P* and *Q*', (2) '*not*-(*not-P* or *not-Q*)', (3) '*P* and *Q* if and only if *not*-(*not-P* or *not-Q*)'. Call the facts represented by (1) and (2) *F*₁ and *F*₂, respectively. Are *F*₁ and *F*₂ two or one (the same)? There is an important meaning of 'same' upon which they are the same. This

meaning I explicate by the analyticity of (3). Since the subsistents exist, there is also a stricter meaning of 'same', such that two facts are the same if and only if the same simples are in the same way connected by the same subsistents. With this meaning of 'same', *F*₁ and *F*₂ are two and not one. The subsistents and the truths which depend only on them are "the world's form." The ontological ground of *F*₁ and *F*₂ being two and not one thus lies not in the world's things but wholly in its form. Yet there are in my world two things, namely, the-thought-that-*P*-and-*Q* and the-thought-that-not-(not-*P*-or-not-*Q*) which are two and not one for the sole reason that if the world's form is taken into account the facts they represent are two and not one. There is thus a kind of things, namely, thoughts, which are unique in that they and they alone among the world's things reflect its form.³⁵ This, I submit, is an adequate realistic₂ account of the feature.

I shall of course not convince Dr. Egidi. To expect that would be merely presumptuous. But I do nourish a more modest hope. I may convince her that there are realists₂ who in *their* way try to resolve the dialectical tensions to which she so keenly responds. If this hope is justified, then I am confident she will eventually find *her* way of rejecting idealism.

³⁵ This is also the deepest structural reason for so explicating 'analytic' that '*P*¹*MP*' becomes analytic or, synonymously, that it becomes a truth in the world's form. There are also quite a few logical (calculational) reasons for this step. Philosophically, though, such reasons do not carry conviction unless they support and are supported by a structural reason that lies rather deep.

³³ For a more detailed statement see essay XII of this book.

³⁴ See May Brodbeck, "La filosofia di John Dewey," *Rivista di Filosofia*, 50, 1959, 391-422.