Published in Dialectica 61, issue 1, 63-84, 2007
which should be used for any reference to this work

(Finean) Essence and (Priorean) Modality

Fabrice CORREIA[†]

ABSTRACT

In Fine 1994, Kit Fine challenges the (widespread) view that the notion of essence is to be understood in terms of the metaphysical modalities, and he argues that it is not essence which reduces to metaphysical modality, but rather metaphysical modality which reduces to essence. In this paper I put forward a modal account of essence and argue that it is immune from Fine's objections. The account presupposes a non-standard, independently motivated conception of the metaphysical modalities which I dub *Priorean*. Arthur Prior never endorsed that very conception, but in some respects his own views on the topic are so close to it, and different from all (most?) currently accepted views, that the label 'Priorean' is perfectly appropriate.

1. Fine on essence and metaphysical modality

It is nowadays widely accepted that to say that an object is essentially so and so is to say that necessarily, the object is so and so, or alternatively, that necessarily, the object is so and so if it exists. (Necessity is of the metaphysical sort here.) Call the first modal account of what it is for something to be essentially so and so the *unconditional account*, and the second one the *conditional account*. In Fine 1994, Kit Fine offers a powerful series of objections to both accounts. It is the aim of this section to present them.

I have just been somewhat obscure as to what these accounts are accounts of. Consider the following two essentialist statements:

- Socrates is essentially human;
- God is essentially such that the actual world is the best of all possible worlds.

I take it that an account of what it is for something to be essentially so and so should have something to say about both statements. More generally, I take it that such an account should have something to say about all essentialist statements of the predicational form '*c* essentially *F*s', where '*c*' names an object and '*F*' is a one-place predicate, as well as about all essentialist statements of the sentential form '*c* is essentially such that *A*', where '*c*' names an object and '*A*' is a sentence.

One may argue that the two forms of expression are at bottom equivalent, thanks to the truth of the following general equivalences:

† Departament de Filosofia, Universitat Rovira i Virgili, Plaça Imperial Tàrraco 1, E 43005 Tarragona, Spain; Email: fabrice.correia@urv.cat

(a) c essentially Fs iff c is essentially such that $F(c)$;
(b) c is essentially such that A iff c essentially Fs – where 'F' is the degenerate one-place predicate 'is such that A'.

On such a view, an account of predicational statements yields *ipso facto* an account of sentential statements, and vice versa. I am personally happy with both equivalences, as Fine is it seems,[1] but some are certainly not. At one extreme, for instance, one may find some who reject the second equivalence because they think that what I call 'degenerate predicates' have no meaning at all, or some who reject it in its general form because they think that a statement of the form 'c is essentially such that A' is meaningful only if 'A' contains a name which is co-referential with 'c'.

Be it as it may, I take it that virtually all of us agree that using the predicational form of expression is a meaningful way of making essentialist claims (if any one is). Thus, in order to avoid contentious presuppositions as much as possible, in my presentation of Fine's objections I will formulate essentialist statements using the form 'c is essentially such that $F(c)$', and I will let those extremists who think that only the genuine predicational form makes sense translate according to the recipe they can extract from (a) above. Under this policy, my presentation of the objections will slightly differ from Fine's, for at some points his discussion involves sentential statements which are not of the form I will use. But these differences will be of no importance.

Fine's objections can be sorted into four sets, which I label SINGLETONS, ESSENTIAL DISTINCTNESS, NECESSARY TRUTHS AND ESSENTIAL EXISTENCE, respectively. Each of the first three sets contains an objection to each account, and the last one an objection to the conditional account only. Let me run through them in turn.

SINGLETONS. Consider Socrates and the singleton-set whose sole element is Socrates, namely {Socrates}. The following general principle of modal set-theory:

(A) Necessarily, if Socrates exists, Socrates belongs to {Socrates}

is very plausible. By the conditional account, it entails:

(1) Socrates is essentially such that Socrates belongs to {Socrates},

and by the unconditional account:

(2) Socrates is essentially such that (if Socrates exists, Socrates belongs to {Socrates}).

Both views about the essence of Socrates are, in contrast to (A), very implausible. As Fine puts it, 'strange as the literature on personal identity may be, it has never been suggested that in order to understand the nature of a person one must know

[1] See Fine 1995*b* section 1.

to which sets he belongs', and we are strongly inclined to think that 'there is nothing in the nature of a person [...] which demands that he belongs to this or that set or which even demands that there be any sets'. Be it as it may, whichever truth-values (A), (1) and (2) do in fact have the important point is the following: neither the view that (A) is true while (1) is false, nor the view that (A) is true while (2) is false, is absurd – both are substantial views which should be compatible with any general account of essence. Now the first view is excluded by the conditional account, and the second view by the unconditional account. Therefore, both accounts have to be rejected.

ESSENTIAL DISTINCTNESS. The view that:

(B) Necessarily, if Socrates exists, Socrates is distinct from the Eiffel Tower

is very plausible. (B) follows from some theses most of us accept, namely that Socrates is distinct from the Eiffel Tower, that distinct things are necessarily distinct, and that a (material) conditional is necessary provided that its consequent is. By the conditional account, (B) entails:

(3) Socrates is essentially such that Socrates is distinct from the Eiffel Tower

and by the unconditional account it entails:

(4) Socrates is essentially such that (if Socrates exists, Socrates is distinct from the Eiffel Tower).

Both (3) and (4) are, in contrast to (B), very implausible. We may paraphrase Fine's remarks about persons and sets here. Strange as the literature on personal identity may be, it has never been suggested that in order to understand the nature of an arbitrary person like Socrates one must know that she is distinct from the Eiffel Tower, and we are strongly inclined to think that there is nothing in the nature of a person like Socrates which demands that she be distinct from the tower or which even demands that there be any such thing as the tower. Be it as it may, whichever truth-values (B), (3) and (4) do in fact have the important point is that neither the conjunction of (B) and not-(3) nor the conjunction of (B) and not-(4) is absurd, both views should be compatible with any general account of essence. But the first view is excluded by the conditional account and the second by the unconditional account. Therefore, both accounts have to be rejected.

NECESSARY TRUTHS. Consider any necessary truth A and any object c. It is then necessary that A should hold if c exists, and also that both A should hold and c exists if c exists. By the conditional account, it follows that it is part of c's essence that c exists and A holds, and by the unconditional account that it is part of c's essence that A if c exists. So for instance, assuming that:

(C) Necessarily, there are infinitely many prime numbers,

the conditional account has it that:

(5) Socrates is essentially such that (Socrates exists and there are infinitely many prime numbers)

and the unconditional account that:

(6) Socrates is essentially such that (if Socrates exists, there are infinitely many prime numbers).

Or again, assuming that:

(D) Necessarily, if Socrates exists, Socrates has the parents he actually has,

the conditional account has it that:

(7) The Eiffel Tower is essentially such that (the Eiffel Tower exists, and if Socrates exists, Socrates has the parents he actually has)

and the unconditional account that:

(8) The Eiffel Tower is essentially such that (if both the Eiffel Tower and Socrates exist, Socrates has the parents he actually has).

Both (C) and (D) have some plausibility, while (5), (6), (7) and (8) are implausible (we could once again paraphrase Fine's remarks about persons and sets here). Be it as it may, it is surely possible to maintain (C) and reject (5) and (6), and to maintain (D) and reject (7) and (8). Therefore, both the conditional and the unconditional accounts have to be rejected.

ESSENTIAL EXISTENCE. An immediate consequence of the conditional account is that everything essentially exists. Yet, essential existence is a feature one may be willing to attribute to certain peculiar entities, say God or the empty set, but surely there should be room for denying that absolutely everything, you and my laptop for instance, essentially exist. Therefore, the conditional account has to be rejected.

These four sets of objections appear to me very convincing, and I will not question them: I will take for granted that (A) & not-(1), (A) & not-(2), (B) & not-(3), (B) & not-(4), (C) & not-(5), (C) & not-(6), (D) & not-(7), (D) & not-(8), and the view that some things do not essentially exist are all views which should be compatible with any general account of essence, and so that both the conditional and the unconditional accounts have to be rejected.

Is there any other account framed in terms of metaphysical modality which could be put forward? Fine claims that 'it is hard to be definitive on such a matter' and his final view, which he puts forward without real argument, is that there is none. If essence and metaphysical modality are not connected the way the standard accounts suggest, then what is the relationship between the two? Fine claims that it is not essence which reduces to metaphysical necessity, but rather metaphysical necessity which reduces to essence – and that essence cannot be understood in fundamentally different terms. His view is that for a proposition to be necessary is for it to be true in virtue of the nature of all objects.

My opinion is that Fine's claims about the relationship between essence and modality are incorrect. In the last section of this paper I will propose an account of essence framed in terms of metaphysical modality, and argue that it is immune from the objections to the standard accounts presented above. The account presupposes a non-standard, independently motivated conception of the metaphysical modalities, and its formulation involves a non-standard modal concept I call *Priorean strict implication*. In the next three sections, I spell out that conception and characterize Priorean strict implication.[2]

2. Possibility and necessity: global versus local

Suppose that God and Satan are both such that it is impossible that they fail to exist. Also suppose that each of them is such that necessarily, He has intrinsic powers which would automatically make Him the master of the universe if nothing external prevented these powers from being realized. Suppose finally that due to certain intrinsic features God necessarily has in addition, His existence excludes that anyone or anything else but Him be the master of the universe, so that it is impossible that both God exist and anyone or anything else but Him, e.g. Satan, be the master of the universe. It then follows that it is impossible that Satan should be the master of the universe.

Now compare this impossibility with the impossibility that Socrates be both human and not human, and with the impossibility that Socrates be a number. There appears to be a striking difference between the former and the latter two. That Satan be the master of the universe is *extrinsically* impossible. There is nothing in the state of affairs consisting in Satan's being the master of the universe to prevent it from obtaining; it cannot obtain only because some other, as it were extraneous, states of affairs necessarily obtain and prevent it from obtaining. In contrast, that Socrates be both human and not human, and that Socrates be a number, are *intrinsically* impossible. The state of affairs consisting in Socrates' being both human and not human cannot obtain, and this impossibility is, as it were, built into the state of affairs itself, it does not have its grounds in facts

[2] There is a natural reaction to Fine's objections to the modal accounts of essence which is based on a distinction between properties which 'really characterize' the objects which have them and those which do not. The idea is to formulate an account of essence which has it that 'c is essentially such that $F(c)$' entails 'Fing really characterizes c' – for instance the account which says that 'c is essentially such that $F(c)$' should be understood as 'Fing really characterizes c, and necessarily, if c exists, then $F(c)$'. I have some sympathy for such a move, but going that way requires giving an account of what it is for a property to really characterize an object, and this is a very tricky task. (Gorman 2005 discusses accounts of essence framed in terms of the notion of real characterization, but he does not say much on how it is to be understood.)

concerning other, extraneous states of affairs. And the same goes for the state of affairs consisting in Socrates' being a number.

The previous considerations suggest a distinction between two concepts of impossibility I will dub *local* and *global*, respectively. Local impossibility is intrinsic impossibility. Global impossibility is impossibility *tout court*, and it includes both intrinsic and extrinsic impossibility. To these two concepts of impossibility correspond via negation two concepts of possibility, the concept of local possibility and the concept of global possibility. That Socrates be both human and not human, and that Socrates be a number, are locally, and so globally, impossible. In contrast, that Satan be the master of the universe is globally impossible but locally possible. In the rest of this paper I shall use $\Diamond_L$ for 'it is locally possible that', $\Diamond_G$ for 'it is globally possible that', $\Box_L$ for 'it is locally necessary that' and $\Box_G$ for 'it is globally necessary that'. I identify $\Box_L$ to $\neg\Diamond_L\neg$ and $\Box_G$ to $\neg\Diamond_G\neg$.[3]

There is a crucial difference between local and global possibility which is worth stressing. The formulation of this difference requires some preliminary considerations about quantification and the notion of "there being facts about something".

I will take for granted, along with others, that there is a sense of 'there is' under which the expression satisfies the following principle: every sentence of type '*c* is so and so' entails the corresponding sentence 'there is something which is so and so'. (Here and below, I use '*c*' for an expression which refers to an object.) In that sense, 'there is' has no 'existential import', i.e. it does not satisfy the following principle: every sentence of type 'there is something which is so and so' entails the corresponding sentence 'there is something which exists and is so and so'. For suppose, for a *reductio*, that it satisfies the second principle. By the first principle, every sentence of type '*c* does not exist' entails 'there is something which does not exist'. By the second principle, it follows that every sentence of type '*c* does not exist' entails 'there is something which exists and does not exist'. Given that 'there is something which exists and does not exist' is logically false, it follows that every sentence of type '*c* does not exist' is logically false as well. But logical falsity entails impossibility, both local and global, and we want to say, at least it is coherent to hold, that some sentences of type '*c* does not exist' are possibly true (both locally and globally) – e.g. 'Socrates does not exist'. In the rest of this paper, I shall use $\exists$ for the 'existential' quantifier so understood and $\forall$ for the corresponding universal quantifier.

Following Arthur Prior, let me use the expression 'there are facts about *c*' as synonymous with 'something is true of *c*'.[4] Given the meaning of 'something is

[3] Here and very often below, for the sake of readability I fail to respect the use/mention distinction. This should not create any confusion.

[4] Prior 1957, p. 31. Prior takes 'there are facts about *c*' and '*c* exists' to be logically equivalent, but I do not. See the end of the next section.

true of', the following principle holds: every sentence of type '*c* is so and so' entails 'there are facts about *c*'. Notice that a consequence of the principle is that every sentence of type 'there are no facts about *c*' is logically false, and so impossibly true (both locally and globally). For by the principle, 'there are no facts about *c*' entails 'there are facts about *c*', and consequently entails 'there are no facts about *c* and there are facts about *c*', which is a contradiction.[5]

Existential quantification and the notion of there being facts about something are intimately linked: 'there is something which is identical to *c*' (i) entails, and (ii) is entailed by, 'there are facts about *c*'. (i) directly follows from the above-mentioned principle governing the notion of there being facts about something. And (ii) follows from above-mentioned principle governing existential quantification, plus the thesis that 'there are facts about *c*' entails 'there are facts about *c* and *c* is identical to *c*', plus the thesis that every conjunction entails any of its conjuncts.

Let me now turn to the difference between local and global possibility I previously mentioned. Where 'γ' designates one or more objects, let us use:

- 'γ is/are universal' for 'γ is the only object that there actually is/are all the objects that there are', i.e. for '$\forall x(x$ is one of $\gamma \equiv \exists y(y = x))$',

and

- 'γ is/are ontically closed' for 'it is locally possible that γ is/are universal'.[6]

By the previous considerations about quantification and the notion of there being facts about something, 'γ is/are universal' is logically equivalent to both '$\forall x(x$ is

[5] Perhaps all this is not altogether clear to the reader, so let me rephrase things in a different way. Using the resources of quantification into predicate position, 'there are facts about *c*' can be rendered by 'for some φ, φc' – see Prior 1957, p. 31. (i) The above mentioned principle holds, for it is a general principle of the logic of quantification into predicate position that from '*Fc*' ('*F*' any one-place predicate, which may be as complex as one wishes) one can infer 'for some φ, φc'. (ii) A consequence of that principle is that every sentence of type 'there are no facts about *c*' is logically false. For suppose for a *reductio* that 'there are no facts about *c*', i.e. '$\neg$(for some φ, φc)', is true. By the principle, it follows that 'there are facts about *c*', i.e. 'for some φ, φc' is true. From our assumption, we can then infer that the conjunction of 'there are facts about *c*' and of its negation is true. But this conjunction is a contradiction. So our assumption has to be rejected on logical grounds alone, so its negation is a logical truth, i.e. it is logically false. (Prior himself gives what is essentially the same argument in Prior 1957, p. 34: '[…] "There are no facts about me" […] is self-contradictory. For if it were true that there are no facts about me, then there would be *this* fact about me, that there are no facts about me, and so it would be false'.)

[6] I take it, with some others (e.g. George Boolos, see Boolos 1984) that we can achieve plural reference, and use plural quantifiers, without being committed to singular reference to, and singular quantification over, entities containing (being made of, being composed of) several objects like sets, or collections, or what have you. Here as well as in the rest of this paper, I will understand 'is one of' in an extended sense: in case '*c*' and '*d*' are singular terms, I will take '*c* is one of *d*' to be synonymous with '*c* is identical to *d*'.

one of γ)' and '$\forall x$(x is one of $\gamma \equiv$ there are facts about x)'. Let then α be all the objects there actually are. Since what is actually true is locally possible, α are ontically closed. What about an object/objects which does not/do not jointly exhaust the totality of all the objects that there are?

'γ is/are ontically closed' is presumably false in some cases where 'γ' refers to less than α. For instance, one may hold with some plausibility that {Socrates} is not ontically closed. For if it was locally possible that {Socrates} be the only object that there is, then it would be locally possible that there be facts about {Socrates} and about it only, and intuitively this is false: there being facts about the singleton requires that there be facts about Socrates. On the other hand, it can be maintained that some objects which fail to comprise one of α are ontically closed. For instance, it makes good sense to say that the pure sets are. Call the view that some object/objects which does not/do not jointly exhaust the totality of all the objects that there are is/are ontically closed *the closure thesis*.

The closure thesis marks a big difference between local and global possibility. For it can be argued that the version of the closure thesis for global possibility is false. In fact, take any object c whatsoever and let γ be any object distinct from c, or any objects which do not comprise c. One can argue that it is globally impossible that everything be one of γ, i.e. that,

(a) $\Box_G \neg\forall x(x \text{ is one of } \gamma)$,

as follows. First, it is globally impossible that there be no fact about c, i.e.

(b) $\Box_G$(there are facts about c).

For as we saw, 'there is no fact about c' is logically false, and what is logically false is not globally possible. Second, it is globally impossible that both there be facts about c and everything be one of γ, i.e.

(c) $\Box_G$(there are facts about $c \supset \neg\forall x(x$ is one of $\gamma)$).

For 'there are facts about c' entails 'something is identical to c', and 'something is identical to c' and 'everything is one of γ' together entail 'c is one of γ'. So if it was globally possible that both there are facts about c and everything is one of γ, then it would be globally possible that c is one of γ. But since c is not one of γ, it is globally impossible that it be. Finally, (a) follows from (b) and (c) by the validity of schema K for global necessity, i.e. $\Box_G A \supset (\Box_G(A \supset B) \supset \Box_G B)$.

I have just assumed that modal schema K is valid for global necessity, and I also did so at the beginning of this section in the example involving God and Satan. That schema K is valid for global necessity is a widely shared view. The previous considerations suggest that, in contrast, schema K for local necessity is not valid. In fact, as I have argued, it can be maintained that there are some object or objects γ such that (i) something is not one of γ and (ii) $\neg\Box_L\neg\forall x(x$ is one of

γ). Now suppose there is such an object or such objects γ, and let c be an object which is not one of γ. For one thing, what is logically false is locally impossible, and so $\Box_L$(there are facts about c). And for another thing, one can argue, as I did before in favor of (c), for the view that $\Box_L$(there are facts about $c \supset \neg\forall x$(x is one of γ)).

3. A semantical characterization of local and global possibility and necessity

In the previous section I introduced and somehow illustrated the local/global distinction. In the present section I wish to present a world-semantics for the local and the global modalities, similar, *qua* world-semantics, to familiar semantics for the global modalities. Although the semantics is only partial (in particular, it does not deal with iterated modalities), it will help have a better grasp on these notions.

The language $\mathcal{L}$ to be semantically characterized is an interpreted first-order language with individual constants, the binary identity predicate = and the unary existence predicate E, enriched with certain items, namely:

- the local possibility operator $\Diamond_L$;
- the global possibility operator $\Diamond_G$;
- genuinely plural constants, among them 'α';
- the plurality membership predicate ε.

We assume that the sole truth-functional connectives of $\mathcal{L}$ are $\neg$ (negation) and $\wedge$ (conjunction) and that its sole quantifier is the existential quantifier $\exists$ we previously met. Predicate ε is synonymous with 'is one of'. Constant 'α' refers to α, i.e. all the objects that there actually are. Each genuinely plural constant refers to two or more objects which are among α, and each individual constant to one of α. We will not need constants which do not actually refer but could (locally or possibly) refer. Notice that language $\mathcal{L}$ is not endowed with plural variables and quantifiers. We will be able to partly mimic plural quantification thanks to the following assumption: every object among α is referred to by some individual constant, and given any objects which are among α, some genuinely plural constant refers to them. I take it that in order to do things properly, this assumption should be dropped and plural variables and quantifiers introduced, but for the sake of simplicity I will keep things as they stand.

Let an *individual term* be either an individual variable or an individual constant, and let a *term* be either an individual term or a genuinely plural constant. The *basic formulas* of $\mathcal{L}$ are then defined as follows:

- Where F is an n-ary predicate distinct from ε and $t_1, \ldots, t_n$ are n individual terms, $F(t_1, \ldots, t_n)$ is a basic formula;
- Where t_1 is an individual term and t_2 a term, $t_1 \varepsilon t_2$ is a basic formula;

- Where A and B are basic formulas and x a variable, $\neg A$, $A \wedge B$ and $\exists xA$ are basic formulas.

We then define the *formulas* of $\mathcal{L}$ as follows:

- Basic formulas are formulas;
- Where A and B are basic formulas, $\Diamond_L A$ and $\Diamond_G A$ are formulas;
- Where A and B are formulas and x a variable, $\neg A$, $A \wedge B$ and $\exists xA$ are formulas.

We adopt abbreviations introduced in the previous section, as well as standard meta-linguistic terminology and conventions. In particular, we define a *sentence* of $\mathcal{L}$ as any of its formulas which contains no free variable. We also define a *basic sentence* of $\mathcal{L}$ as any of its basic formulas which contains no free variable.

A notion which plays a crucial role in the semantics for $\mathcal{L}$ is that of *objectual content*. The objectual content of a sentence A – in symbols: $|A|$ – is the class of all objects the sentence is about, i.e. the class of all objects referred to by some expression in the sentence. Thus, the objectual content of 'Socrates and Plato are distinct' is the class consisting of Socrates and Plato, and the objectual content of 'everything is human if human' is the empty class. For the sake of simplicity, we shall assume that the predicates of $\mathcal{L}$ make no reference to any object (unlike e.g. the predicate 'is Sam's brother'), so that the objectual content of any of its sentences is the class of all objects referred to by the individual or genuinely plural constants the sentence contains. Dropping that assumption would yield no special difficulty.

Also central to the semantics are the notions of a *locally possible world* and of a *globally possible world*.[7] The main idea of the semantics is indeed to characterize local possibility as truth at some locally possible world, and global possibility as truth at some globally possible world. Given that what is globally possible is locally possible, the semantics has it that the class of all globally possible worlds is part of the class of all locally possible worlds. At a globally possible world, there are facts about absolutely everything that is one of α. This does not hold of *strictly* locally possible worlds, i.e. of locally possible worlds which are not globally possible: given any strictly locally possible world, there is at least one object among α such that there are no facts about that object at that world. A strictly locally possible world is, so to speak, a globally possible

[7] Two remarks: (i) I personally regard the notions of local possibility and of global possibility as more basic than the notions of a locally possible world and of a globally possible world, but nothing in what follows turns on that view; (ii) I will remain neutral as to the nature of possible worlds, in particular as to whether they are concrete universes, or infinite conjunctions of propositions, or sets of states of affairs, or what have you.

world in miniature: it is systematically blind to states of affairs concerning some of α.[8]

Let us now turn to the semantics proper. Language $\mathcal{L}$ is interpreted via a model $\langle @, W, D, i\rangle$, where W is the class of all *locally possible worlds* (I will often say 'world' instead of 'locally possible world'), $@ \in W$ is *the actual world*, D is the *domain* function, and i is the *interpretation* function. Function D takes each world w into the class D_w, the domain of w, which is the class of all objects that there are at that world. Function i takes:

- each individual constant into the unit-class of its reference, which is a subclass of $D_@$;
- each genuinely plural constant into the class consisting of all the members of its reference, which a subclass of $D_@$;
- constant 'α' into $D_@$;
- each n-place predicate distinct from = and ε and world w into the extension of that predicate at that world, which is a subclass of D^n_w.

Notice that the semantic value of any constant, individual as well as genuinely plural, is taken to be a *class*. This makes possible a homogenous formulation of the semantics in a familiar class-theoretical language. One could easily rewrite the whole semantics using talk involving plural expressions.

Following the same policy, we shall take individual variables to range over unit-classes. An *assignment to the variables* – an assignment, for short – is a function which takes every individual variable into the unit-class of an element of $\cup_{w \in W} D_w$. Where x is an individual variable, two assignments are *x-alternatives* iff they differ at most on which unit-class they take x into. Where μ is an assignment and t a term, $i\mu(t)$ is $i(t)$ if t is a constant, and $\mu(t)$ if t is a variable. And where μ is an assignment and t an individual term, $\overline{i\mu}(t)$ is the element of $i\mu(t)$.

The *objectual content* of a formula A relative to assignment μ – $|A|_\mu$ for short – is the union of the following two classes:

- $\mathrm{U}(x$ a variable which occurs freely in $A)^{\mu(x)}$;
- $\mathrm{U}(\gamma$ a constant which occurs in $A)^{i(\gamma)}$.

$|A|_\mu$ is the class of all objects A is about according to μ. In case A is a sentence, its objectual content relative to any pair of assignments is the same, and is just its objectual content to *court*, namely $|A|$.

[8] One may think that given what I just said about strictly locally possible worlds, there can be no such things. For if c is one of α, one may argue, the sentence 'there are no facts about c' is logically false, and so there can be no possible world at which the sentence is true. The argument is correct. But here and below in this paper, I use 'there are no facts about – at world …' to express what 'there is no *sentence* S such that (i) S is about –, and (ii) S is true at world …' expresses. A strictly locally possible world is a world w such that, for some object c among α, no sentence about c is true at w.

We define truth-at-a-world-relative-to-an-assignment for *basic* formulas as follows:

- For F distinct from both = and ε, $w \models_{\mu} F(t_1, \ldots, t_n)$ iff $\langle \overline{i\mu}(t_1), \ldots, \overline{i\mu}(t_n)\rangle \in i(F, w)$;
- $w \models_{\mu} t_1 = t_2$ iff $i\mu(t_1) = i\mu(t_2)$ and $i\mu(t_2) \subseteq D_w$;
- $w \models_{\mu} t_1 \in t_2$ iff $i\mu(t_1) \subseteq i\mu(t_2)$ and $i\mu(t_2) \subseteq D_w$;
- $w \models_{\mu} \neg A$ iff both $|A|_{\mu} \subseteq D_w$ and $w \not\models_{\mu} A$;
- $w \models_{\mu} A \wedge B$ iff both $w \models_{\mu} A$ and $w \models_{\mu} B$;
- $w \models_{\mu} \exists x A$ iff for some x-alternative ρ of μ such that $\rho(x) \subseteq D_w$, $w \models_{\rho} A$.

(Notice the clause for negation. Also notice that by the clauses for identity and plurality membership, the former notion is definable in terms of the latter.) We shall say that a basic sentence A is *true at a world* iff it is true at that world relatively to some assignment (or equivalently, relatively to all assignments). Truth-relative-to-an-assignment for formulas is then defined as follows:

- If A is a basic formula, then:
  - $\models_{\mu} A$ iff $@ \models_{\mu} A$;
  - $\models_{\mu} \Diamond_{\mathsf{L}} A$ iff for some $w \in W$, $w \models_{\mu} A$;
  - $\models_{\mu} \Diamond_{\mathsf{G}} A$ iff for some $w \in W$ such that $D_{@} \subseteq D_w$, $w \models_{\mu} A$;
- If A and B are formulas, then:
  - $\models_{\mu} \neg A$ iff $\not\models_{\mu} A$;
  - $\models_{\mu} A \wedge B$ iff both $\models_{\mu} A$ and $\models_{\mu} B$;
  - $\models_{\mu} \exists x A$ iff for some x-alternative ρ of μ such that $\rho(x) \subseteq D_{@}$, $\models_{\rho} A$.

Notice that for A a basic formula, we have then:

- $\models_{\mu} \Box_{\mathsf{L}} A$ iff for every $w \in W$ such that $|A|_{\mu} \subseteq D_w$, $w \models_{\mu} A$;
- $\models_{\mu} \Box_{\mathsf{G}} A$ iff for every $w \in W$ such that $D_{@} \subseteq D_w$, $w \models_{\mu} A$.

Finally, we shall say that a sentence A is *true* iff it is true relatively to some assignment (or equivalently, relatively to all assignments). Where A is a basic sentence, we have then:

- $\Diamond_{\mathsf{L}} A$ is true iff A is true at some locally possible world;
- $\Box_{\mathsf{L}} A$ is true iff A is true at every locally possible world whose domain contains its objectual content;
- $\Diamond_{\mathsf{G}} A$ is true iff A is true at some globally possible world;
- $\Box_{\mathsf{G}} A$ is true iff A is true at every globally possible world.

(A globally possible world is a world whose domain comprises $D_{@}$.) Of course, this formally defined notion of truth is intended to be coextensive with the ordinary concept of truth on the class of all sentences of $\mathcal{L}$. We shall assume, as the central claim of this semantical characterization of $\mathcal{L}$, that this holds.

Some points relative to the semantics for $\mathcal{L}$ are worth stressing.

(1) Where x is any variable, let us use Φx for $\exists y(y = x)$, y the first variable distinct from x (here and below we suppose given a fixed enumeration of the variables). By some considerations from the previous section, Φx can be used to express what 'there are facts about x' expresses. Then given any world w and any assignment μ:

- $w \models_\mu \Phi x$ iff $\mu(x) \subseteq D_w$.

The domain of a world is the class of all objects there are facts about at that world.

(2) Where γ is a constant, let $\Phi\gamma$ be short for $\forall x(x \in \gamma \supset \Phi x)$, x the first variable in the enumeration. $\Phi\gamma$ can be used to express what 'there are facts about each one of γ' expresses. Then for every world w:

- $w \models \Phi\gamma$ iff $i(\gamma) \subseteq D_w$.

It follows that $w \models \Phi\alpha$ iff $D_@ \subseteq D_w$. A world is globally possible iff at that world, there are facts about every object there actually is.

(3) Let γ be a constant. The sentence 'γ is/are universal' can be rendered in $\mathcal{L}$ by the basic sentence $\forall x(x \in \gamma \equiv \exists y(y = x))$, x the first variable in the enumeration and y the second. Then given any world w:

- 'γ is/are universal' is true at w iff $i(\gamma) = D_w$.

One of α / some objects among α is/are universal at a world iff it constitutes/they constitute the domain of that world. Notice that 'γ is/are universal' is true at a world iff $\forall x(x \in \gamma)$ is (x the first variable in the enumeration), iff $\forall x(x \in \gamma \equiv \Phi x)$ is (x the first variable in the enumeration again). The sentence 'γ is/are ontically closed' can be rendered by the sentence '$\Diamond_\mathsf{L}$(γ is/are universal)'. Then:

- 'γ is/are ontically closed' is true iff for some $w \in W$, $i(\gamma) = D_w$.

One of α / some objects among α is/are ontically closed iff it constitutes/they constitute the domain of some world. It follows that α are ontically closed.

(4) The closure thesis can be expressed as: for some constant such γ that $i(\gamma) \neq D_@$, 'γ is/are ontically closed' is true. This is equivalent to: some (non-empty) world-domain is a proper part of $D_@$. Notice that if the closure thesis is true, then some world-domain fails to comprise $D_@$. As I previously argued, sense can be made of the view that the closure thesis is true. Its truth is actually compatible with the semantics just presented: nothing in the semantics tells us that no world-domain can consist in some but not all of α. I also previously argued against the version of the closure thesis for global possibility. The semantics actually invalidates that version of the thesis. For '$\Diamond_\mathsf{G}$(γ is/are universal)' is true only if $i(\gamma) = D_@$.

(5) For every basic sentence A and every world w:

- $(w \models A$ or $w \models \neg A)$ iff $|A| \subseteq D_w$.

A basic sentence has a truth-value at a world iff its objectual content is part of the domain of that world. As a consequence, if the closure thesis is true, then some basic sentences (e.g. 'α are universal') lack any truth-value at some worlds.

(6) If the closure thesis is true, then some local possibilities are not globally possible. For if the thesis is true, then there is a constant γ such that $i(\gamma) \neq D_@$, '$\Diamond_L(\gamma$ is/are universal)' is true, and '$\Diamond_G(\gamma$ is/are universal)' is false.

(7) Where c is an individual constant:

- $\Diamond_L \neg \mathsf{E}c$ is true iff there is a world w such that $i(c) \subseteq D_w$ and not-$i(c) \subseteq i(\mathsf{E},w)$.

Nothing in the semantics tells us that the extension of the existence predicate at a world should be identical to the domain of that world, and so that the right-hand side of this equivalence should be false. This is a good thing, for we want to leave room for the view that some objects among α, e.g. Socrates, locally possibly fail to exist.

(8) Here are four important principles that follow from the semantical characterization of $\mathcal{L}$:

- $\models_\mu \Diamond_G A$ iff $\models_\mu \Diamond_L(\Phi\alpha \wedge A)$;
- $\models_\mu \Box_G A$ iff $\models_\mu \Box_L(\Phi\alpha \supset A)$;
- $\models_\mu \Box_G A \wedge \Box_G(A \supset B) \supset \Box_G B$;
- If $|B|_\mu \subseteq |A|_\mu$, then $\models_\mu \Box_L A \wedge \Box_L(A \supset B) \supset \Box_L B$.

The first two show that in $\mathcal{L}$, the global modalities are definable in terms of the local modalities. The third one conforms to a claim I made in the previous section, namely that modal schema K for global necessity is valid. Finally, the fourth principle says that an $\mathcal{L}$-instance of schema K for local necessity is true relative to an assignment if it satisfies a certain condition on objectual contents relative to that assignment. That condition is not redundant, for it can be shown that if the closure thesis is true, then some of these instances of K are false relative to some assignments, in particular some sentential instances of K are false *tout court*. In fact, suppose the thesis holds. Let γ be a constant such that $i(\gamma) \neq D_@$ and 'γ is/are ontically closed' is true, and let c be an individual constant such that $i(c)$ is not part of $i(\gamma)$. Then on one hand, since 'γ is/are ontically closed' is true, $\neg\Box_L \exists x \neg(x \in \gamma)$ is true (x is the first variable in the enumeration). And on the other hand, the semantics has it that both $\Box_L \Phi c$ and $\Box_L(\Phi c \supset \exists x \neg(x \in \gamma))$ are true. This conforms to a claim I also made in the previous section, namely that modal schema *K* for local necessity is not valid.

Let me close this section with a general remark on the proposed semantics for $\mathcal{L}$. It may appropriately be called a *Priorean* semantics. The reason is that Arthur Prior's views about necessity an possibility, which are embodied in his system Q, lead to a world-semantics for these notions which shares a peculiar property with the semantics for $\mathcal{L}$ presented above: both semantics have it that a sentence may fail to have a truth-value at a world, and that a sentence has a truth-value at a world provided that its objectual content belongs to the domain of that world.[9] Actually, the difference between my semantics and the genuinely Priorean semantics essentially amounts to different views about existence. According to Prior, for a thing to exist is for there to be facts about that thing.[10] I accept that if a thing exists, then there are facts about it, but I deny the converse. For I take it that if there are facts about something, then there is that thing, but I admit that there may be a thing which does not exist. The semantics I proposed would be acceptable to Prior only if it incorporated the view that the extension of the existence predicate at a world is identical to the domain of that world.

4. *Priorean strict implication*

The semantics introduced in the previous section allows one to characterize a binary modal notion I will call *Priorean strict implication – PSI*, for short.[11] Let $\Rightarrow$ express PSI. One can read $A \Rightarrow B$ as 'its being the case that *A* and its not being the case that *B* are incompatible'. PSI will be a crucial ingredient in the account of essence I will present in the next section.

Let language $\mathcal{L}^*$ be $\mathcal{L}$ enriched with $\Rightarrow$. The syntax of $\mathcal{L}^*$ is the same as that of $\mathcal{L}$, with an extra clause in the definition of formulas which says that is *A* and *B* are basic formulas, then $A \Rightarrow B$ is a formula. The semantics for $\mathcal{L}^*$ is also the same as that for $\mathcal{L}$, with an extra truth-clause for $\Rightarrow$:

[9] Prior did not formulate any world-semantics properly speaking. In Prior 1957, chapter V, he introduces his system Q for temporal logic, and suggests an interpretation of Q as a modal system. He provides the propositional version of Q with a semantics formulated in terms of infinite matrices, from which one can make out a world-semantics. And in Prior & Fine 1977, pp. 85–86, he gives some indications as to how to provide Q with such a semantics. See Correia 1999, Correia 2001*a* and Correia 2001*b* for some semantical studies of systems belonging to the family of Q, and for further references on Q and related systems. Let me here mention that, interestingly, both the semantics Fine offers for his quantified logic of essence (see Fine 2000; see also Fine 1995*a*) and the semantics for a propositional version of that logic presented in Correia 2000 have it that a sentence may fail to have a truth-value at a world, and that a sentence has a truth-value at a world provided that its objectual content belongs to the domain of that world.

[10] Prior 1957, p. 31.

[11] See Correia 2001*a* for a formal study on the logic of PSI.

- $\vDash_\mu A \Rightarrow B$ iff for every $w \in W$ such that $w \quad _\mu A$, $w \quad _\mu B$.

It follows:

- $A \Rightarrow B$ is true iff B is true at every world where A is true.

We shall assume, as the central claim of this semantical characterization of $\mathcal{L}^*$, that the formally defined notion of truth for $\mathcal{L}^*$ is coextensive with the ordinary concept of truth on the class of all sentences of $\mathcal{L}^*$.

PSI has many properties one would expect a notion of implication to have. For instance, for every basic sentences A, B and C, the following hold:

- $A \Rightarrow A$ is true;
- If $A \Rightarrow B$ and $B \Rightarrow C$ are true, then so is $A \Rightarrow C$;
- $A \Rightarrow B \wedge C$ is true iff $A \Rightarrow B$ and $A \Rightarrow C$ are true;
- If $A \Rightarrow C$ and $B \Rightarrow C$ are true, then so is $A \vee B \Rightarrow C$.

But certain properties which are regarded by many as constitutive of implication are not possessed by PSI. For example, on the assumption that the closure thesis is true, there are $\mathcal{L}^*$-instances of the following conditional forms:

- If $A \Rightarrow B$ is true, then so is $\neg B \Rightarrow \neg A$
- If $A \Rightarrow B$ is true, then so is $A \Rightarrow B \vee C$
- If $A \vee B \Rightarrow C$ is true, then so are $A \Rightarrow C$ and $B \Rightarrow C$

which are false.

Where A is a basic formula, let us use $\hat{A}$ for $A \vee \neg A$. $\hat{A}$ is true at a world relative to an assignment iff the objectual content of A relative to that assignment is part of the domain of that world. The following important principles hold:

- $\vDash_\mu \Box_{\mathrm{L}} A$ iff $\vDash_\mu \hat{A} \Rightarrow A$;
- $\vDash_\mu \Box_{\mathrm{G}} A$ iff $\vDash_\mu \Phi\alpha \Rightarrow A$;
- $\vDash_\mu A \Rightarrow B$ iff $\vDash_\mu \Box_{\mathrm{L}}(A \supset B)$ and $\vDash_\mu A \Rightarrow \hat{B}$;
- If $\vDash_\mu \Box_{\mathrm{L}} \neg \mathrm{A}$, then $\vDash_\mu A \Rightarrow B$;
- If $\vDash_\mu \Box_{\mathrm{L}} B$ and $\vDash_\mu A \Rightarrow \hat{B}$, then $\vDash_\mu A \Rightarrow B$.

By the first two items, the local and global modalities we previously met are definable in $\mathcal{L}^*$ in terms of PSI. It is actually my view that PSI is more basic than these monadic modalities.

I took care to suggest that $A \Rightarrow B$ should be read as 'its being the case that A and its not being the case that B are incompatible', not as 'its being the case that A and its being the case that not-B are incompatible'. I did it for a good reason. In fact, where A and B are basic sentences, 'its being the case that A and its being the case that not-B are incompatible' is equivalent to $\neg\Diamond_{\mathrm{L}}(A \wedge \neg B)$, and so to $\Box_{\mathrm{L}}(A \supset B)$. In $\mathcal{L}^*$, $A \Rightarrow B$ always implies $\Box_{\mathrm{L}}(A \supset B)$, but the converse does not hold if the closure thesis is true. For example, assuming the truth of the thesis, $\Box_{\mathsf{L}}(\exists x(x = x) \supset \Phi\alpha)$ is true, but not $\exists x(x = x) \Rightarrow \Phi\alpha$ (x the first variable in the enumeration).

The notion of *ontic dependence* will be of some use in the next section. Let γ_1 and γ_2 be two constants. Let us use 'γ_1 is/are ontically dependent upon γ_2' for $\Phi\gamma_1 \Rightarrow \Phi\gamma_2$. '$\gamma_1$ is/are ontically dependent upon γ_2' is true iff 'there being facts about γ_1 and its not being the case that there are facts about γ_2 are incompatible' is. Then:

- 'γ_1 is/are ontically dependent upon γ_2' is true iff for every world w, if $i(\gamma_1) \subseteq D_w$, then $i(\gamma_2) \subseteq D_w$.

Notice that for every constant γ:

- If 'γ is/are ontically closed' is true, then so is '$\forall x(\gamma$ is/are ontically dependent upon $x \supset x \in \gamma)$' (x the first variable in the enumeration).

The converse principle has some plausibility. If it is accepted, then to say that {Socrates} is not ontically closed is to say that it ontically depends upon something else, and to say that the pure sets are ontically closed is to say that they ontically depend upon nothing but themselves.

5. A modal account of essence

Let me now come back to the topic of essence. As we saw, Fine's final view is that no modal account of what it is for an object to be essentially so and so can be found. If 'modal' here points to the global modalities, then I have nothing against his view, and actually I am strongly inclined to think it is correct. But if 'modal' is used unrestrictedly to point to metaphysical modality in general, then I think that the view is incorrect. Here I wish to put forward a modal account framed solely in terms of PSI and of the notion of there being facts about something.

For the sake of definiteness I will take it that the target of the account are statements of the form 'c is essentially such that A', where 'c' names an object and 'A' a sentence. (See the discussion in section 1.) The account I wish to propose is then the following: where 'c' designates an object, 'c is essentially such that A' is to be understood as 'there being facts about c and its not being the case that A are incompatible', i.e. as $\Phi c \Rightarrow A$. On this account, for instance, to say that singleton {Socrates} is essentially such that it contains Socrates is to say that in every world where there are facts about the singleton, it is true that it contains Socrates; and to deny that Socrates is essentially such that it is a member of the singleton is to say that there is a world where there are facts about Socrates and where it is not true that he belongs to the singleton (e.g. because there are no facts about the latter).[12]

One often hears or reads that an object *c* is essentially such that *A* iff it must be the case that *A if c is to be the object that it is*. Two natural ways of formulating the right-hand side of this equivalence are the following:

(a) $(c \text{ is } c) \Rightarrow A$

(where 'is' expresses identity), and

(b) $(c \text{ is something}) \Rightarrow A$

(where 'is' expresses identity and 'something' is understood in the sense of $\exists$). Interestingly, since both '$(c$ is $c) \Rightarrow (c$ is something$)$' and '$(c$ is something$) \Rightarrow (c$ is $c)$' are true, both (a) and (b) are equivalent to '*c* is essentially such that *A*' as understood under the proposed account.

It is my view that Fine's objections to the standard modal accounts of essence do not threaten the proposed account. Let me here run through each of them in turn.

SINGLETONS. We want (A) & not-(1) and (A) & not-(2) to be compatible with any account of essence, where (A), (1) and (2) are the following theses:

(A) Necessarily, if Socrates exists, Socrates belongs to {Socrates};
(1) Socrates essentially belongs to {Socrates};
(2) Socrates is essentially such that (if Socrates exists, Socrates belongs to {Socrates}).

(In (A), as well as in (B), (C) and (D), 'necessarily' expresses global necessity.) Consider the view that (i) Socrates does not ontically depend upon the singleton, i.e. that there are worlds where there are facts about Socrates but no facts about the singleton, and (ii) in every world where there are facts about Socrates and the singleton, Socrates belongs to the singleton if he exists. The view has some plausibility, and at any rate it is consistent, in particular with the account. Now (ii) entails (A), and by the proposed account of essence (i) entails both not-(1) and not-(2). So, the account is compatible with both (A) & not-(1) and (A) & not-(2).

[12] In Fine 1995*c*, p. 269, Fine defines 'object *c* ontologically depends upon object *d*' as 'what *c* is depends upon what *d* is', and he proposes the following account of ontological dependence (p. 275): for *c* to ontologically depend upon *d* is for there to be a proposition about *d* which is true in virtue of the nature of *c*. Given the proposed account of essence, '*c* ontologically depends upon *d*' is equivalent to '*c* ontically depends upon *d*'. For suppose there is a proposition about *d*, say *p*, such that *c* is essentially such that *p*. By my account, it follows that $\Phi c \Rightarrow p$. But since proposition *p* is about *d*, $p \Rightarrow \Phi d$. Therefore, $\Phi c \Rightarrow \Phi d$. Conversely, suppose $\Phi c \Rightarrow \Phi d$. Then there is a proposition *p* about *d*, e.g. the proposition that Φd, such that $\Phi c \Rightarrow p$. By my account, it follows that there is a proposition about *d* which is true in virtue of the nature of *c*.

ESSENTIAL DISTINCTNESS. We want (B) & not-(3) and (B) & not-(4) to be compatible with any account of essence, where (B), (3) and (4) are the following theses:

(B) Necessarily, if Socrates exists, Socrates is distinct from the Eiffel Tower;
(3) Socrates is essentially distinct from the Eiffel Tower;
(4) Socrates is essentially such that (if Socrates exists, Socrates is distinct from the Eiffel Tower).

That the proposed account is all right in this respect can be argued for by considering the view that (i) there are worlds where there are facts about Socrates but no facts about the Eiffel Tower, i.e. that Socrates does not ontically depend upon the tower, and (ii) in every world where there are facts about Socrates and the tower, Socrates is distinct from the tower if he exists. See above.

NECESSARY TRUTHS. We want (C) & not-(5), (C) & not-(6), (D) & not-(7) and (D) & not-(8) to be compatible with any account of essence, where (C), (5), (6), (D), (7) and (8) are the following theses:

(C) Necessarily, there are infinitely prime numbers;
(5) Socrates is essentially such that (Socrates exists and there are infinitely many prime numbers);
(6) Socrates is essentially such that (if Socrates exists, there are infinitely many prime numbers);
(D) Necessarily, if Socrates exists, Socrates has the parents he actually has;
(7) The Eiffel Tower is essentially such that (the Eiffel Tower exists, and if Socrates exists, Socrates has the parents he actually has);
(8) The Eiffel Tower is essentially such that (if both the Eiffel Tower and Socrates exist, Socrates has the parents he actually has).

That the proposed account is compatible with both (C) & not-(5) and (C) & not-(6) can be argued for by considering the view that (i) there are worlds where there are facts about Socrates but no facts about numbers, and (ii) in every globally possible world, there are facts about numbers, and in particular the fact that there are infinitely many prime numbers. For the case of (D) & not-(7) and (D) & not-(8), one may consider the view that (i) there are worlds where there are facts about the Eiffel Tower but no facts about Socrates, and (ii) in every world where there facts about both, if Socrates exists, he has the parents he actually has. See above once again.

ESSENTIAL EXISTENCE. We want the view that some things do not essentially exist to be compatible with any account of essence. Under the proposed account, to say that object *c* does not essentially exist is to say that it is not locally necessary that *c* exists, i.e. that there are worlds where there are facts about *c* but where *c* fails to exist. And as we saw, there is nothing problematic with that. We would be in trouble if we wanted any account of essence to be compatible with the view that some things are such that it is not essential to them that there be facts about them, for on the proposed account this is ruled out. Fortunately, this is not something that we want: it is obviously part of the nature of every object that it is something, i.e. and object, and so that there are facts about it.

So, the account of essence framed in terms of PSI fares well as far as Fine's objections to the standard modal accounts are concerned. In the remaining part of this section, I wish to deal with the topic of 'collective' essence.

As I mentioned in section 1, Fine holds that for a proposition to be necessary is for it to be true in virtue of the nature of all objects. Fine formulates his reductive thesis by means of the essentialist operator 'it is true in virtue of the nature of . . . that –', where '. . .' is to be filled up with an expression which picks out *one or more* objects and '–' by a sentence. This operator expresses what we may call a notion of *collective* essence, as opposed to the notion of *individual* essence we have been dealing with up to now. (On this understanding of 'collective', an individual essentialist statement counts as collective.) How is Fine's notion to be understood, and how is it related to the more common notion of individual essence?

Let the *essence* of a given object or of given objects be the class of all propositions true in virtue of the nature of that object or of these objects. As Fine understands collective essence, where $c_1, c_2, \ldots$ are given objects, the essence of $c_1, c_2, \ldots$ includes the essence of each one of $c_1, c_2, \ldots$, but it may not reduce to the union of the essence of c_1 with the essence of c_2 with . . . : there may be propositions true in virtue of the nature of several objects taken together which are not true in virtue of the nature any of these objects taken separately. For instance, it may be thought that the proposition that 3 is smaller than 4 is true in virtue of what number 3 and number 4 are but neither in virtue of the nature of 3 nor in virtue of the nature of 4, or again that the proposition that Socrates is distinct from the Eiffel Tower is true in virtue of the nature of these two objects taken together but not in virtue of any one of them taken in isolation.[13]

The previous account of individual essence in terms of PSI leads in a natural way to an account of the more general notion of collective essence along the following lines: where 'γ' designates one or more objects, 'γ is/are essentially such that A' is to be understood as 'there being facts about γ and its not being the case that A are incompatible', i.e. as $\Phi\gamma \Rightarrow A$. As we saw in the previous section, every sentence which is an $\mathcal{L}^*$-instance of $\Box_G A$ is equivalent to the corresponding instance of $\Phi\alpha \Rightarrow A$. If we take this to hold unrestrictedly (and not only of $\mathcal{L}^*$-sentences), the proposed account of collective essence makes true the Finean equation between essence and global necessity: every instance of $\Box_G A$ is equiv-

[13] See the discussion in Fine 1995*b*, section 7.

alent to the corresponding instance of 'it is true in virtue of the nature of all objects that *A*'.[14]

Conclusion

The account of essence proposed in this paper presupposes a non-standard conception of metaphysical modality, which I have tried to spell out to some extent. I hope the way I did it will convince the reader that the conception is viable and independently motivated. Clearly, much more on that conception should be said. In particular, a systematic study of the logic of the non-familiar metaphysical modalities introduced in this paper should be undertaken, together with a comparison with the Finean logic of essence as presented and studied in Fine 1995*a*, Fine 2000 and Correia 2000. This is something I hope to do elsewhere.*

References

Boolos, G. 1984, 'To Be Is to Be a Value of a Variable (or to Be Some Values of Some Variables)', *Journal of Philosophy* **81**, pp. 430–449.

Correia, F. 1999, 'Adequacy Results for some Priorean Modal Propositional Logics', *Notre Dame Journal of Formal Logic* **40**, pp. 236–249.

Correia, F. 2000, 'Propositional Logic of Essence', *Journal of Philosophical Logic* **29**, pp. 295–313.

Correia, F. 2001a, 'Priorean Strict Implication, Q and Related Systems', *Studia Logica* **69**, pp. 1–17.

Correia, F. 2001b, 'Weak Necessity on Weak Kleene Matrices', in: *Advances in Modal Logic*, Vol. 3, NJ:World Scientific, pp. 73–90.

Fine, K. 1994, 'Essence and Modality', *Philosophical Perspectives* **8**, pp. 1–16.

Fine, K. 1995a, 'The Logic of Essence', *Journal of Philosophical Logic* **24**, pp. 241–273.

Fine, K. 1995b, 'Senses of Essence', in: W. Sinnott-Armstrong, ed., *Modality, Morality and Belief*, Cambridge: Cambridge University Press.

Fine, K. 1995c, 'Ontological Dependence', *Proceedings of the Aristotelian Society* Vol. **XCV** Part 3, pp. 269–290.

[14] In this paper, I have ignored two distinctions Fine makes in Fine 1995*b* (see sections 3–5), the distinction between *immediate* and *mediate* essence, and the distinction between *consequentialist* and *constitutive* essence. A friend of these distinctions would say that the notion of essence which is captured by my account is, at best, a notion of mediateconsequentialist essence, and at the present point she would press me to say something about immediate essence, constitutive essence, and about how exactly the mediate is obtained from the immediate and the consequentialist from the constitutive. My reply would be that, although I think these distinctions have some sort of intuitive appeal, I have serious doubts about whether they can be formulated in a precise way, and so whether there is something really substantial to them.

* A previous, and quite different, version of this paper was presented at the colloquium *Fine philosophy – the philosophy of Kit Fine*, Geneva, June 2005. I wish to thank the participants for their comments and suggestions. This work was carried out while I was "Investigador Ramón y Cajal" and a member of the LOGOS research group (Barcelona, Spain) and of the following two Spanish research projects: "Ontological Dependence" (HUM2004-05609-C02-01 (MEC), Barcelona, dir. Manuel García-Carpintero) and "Explicación y representación en la ciencia: aspectos pragmáticos y estructurales" (HUM2005-04369 (MEC), Tarragona, dir. José Díez Calzada).

Fine, K. 2000, 'Semantics for the Logic of Essence', *Journal of Philosophical Logic* **29**, pp. 543–584.
Gorman, M. 2005, 'The Essential and the Accidental', *Ratio* **18**, pp. 276–289.
Prior, A. 1957, *Time and Modality*, Oxford: Oxford University Press.
Prior, A. and Fine, K. 1977, *Worlds, Times and Selves*, Amherst: University of Massachusetts Press.