

# RAÚL ORAYEN'S VIEWS ON PHILOSOPHY OF LOGIC

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Raúl Orayen's *Lógica, significado y ontología*<sup>1</sup> is a profound book, a thorough inquiry into several important issues in the philosophy of logic. Raúl Orayen is one of the outstanding analytical philosophers in the Spanish speaking world. As in his other publications, he displays a masterly reasoning power. No patched-up solutions in this book. Orayen is not going to let what he takes to be unsatisfactory treatments off the hook with vague considerations of their being able to cope «somehow or other» with such difficulties as beset them.

The book's general line may be taken to be the defence of some kind of intensional approach in philosophy of logic, with meanings playing a central role in implementing the notion of logical truth.

Orayen regards Quine as his main interlocutor. He is keen on keeping set theory as the general framework of our worldview, and cleaves to classical logic. Yet, precisely because Quine's thought has challenged the intensional notions he considers indispensable, several chapters are given over to discussing Quinean arguments. All in all it is fair to say that the book is further proof that Quine's contributions are at the very core of contemporary philosophy of language and philosophy of logic.

There is a major topic gone into through the book, which is logical form, validity and logical truth. As an outgrowth, Quine's operationalist view of language receives an extensive coverage and discussion. Then, the investigation into the notion of logical truth and validity leads to a critical assessment of the relevantist challenge to the classical conception. And finally — if perhaps a little cursorily — acknowledging the ontological assumptions of the classical first-order calculus raises the issue of how to deal with Meinongian approaches, especially Castañeda's. This last chapter, although short, is quite important and will be duly gone into in this review. On the other hand, I will not dwell on Orayen's discussion of the indeterminacy of translation thesis — a subject on which I broadly agree with him, if for partly different reasons.

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<sup>1</sup> Mexico: Universidad Nacional Autónoma de México, 1989. Pp. 323.

### §1.— Truth-bearers, Logical Truth and Validity

Orayen's approach is dual. In natural language the primary truth-bearers are sentence-tokens. In formal or artificial languages they are sentence-types. Such a cleavage is so strong and even startling that the reader may straight away demand a sufficiently strong justification thereof. Orayen provides it.

In any natural language there are plenty of sentences (types) which cannot be given a general meaning once and for all, i.e. which are such that only their respective tokens can be ascribed meanings depending on the particular utterance context. If we are keen on ascribing truth to types, then we need to regard truth not as a property but as a relation, and one with a large number of places. So the sentence type 'John will be ready by tomorrow morning' will be true for a particular entity (probably a man) being in that case denoted by 'John', a particular task intended for which he is supposed to be ready, a particular day on which the sentence is uttered, and so on. If it is uttered on the sun, it cannot apparently be true since on stars there is no to-morrow and no morning — unless our planet's standards apply everywhere, or anything like that. Moreover, a sentence exactly like that one both in spelling and pronunciation may belong to a different language, wherein it may mean that cheese is a healthy food, e.g., which may be true or false according to the context. Not only is the number of arguments or places for the relation high, but moreover it seems variable. Well, perhaps that could be dealt with by letting a number of them feature in every sentence, even if trivially or vacuously so. Or they can all be packed into «the context». But all such solutions have difficulties of their own. At the same time, a number of sentence tokens lack definite truth value. Think of the just written sentence when no task is intended, or no entity with which the utterer or the listener are acquainted is named 'John' etc.

Thus, Orayen chooses to ascribe truth to some sentence tokens (which have been or will be actually uttered), individuated by their respective utterance context, and which he calls '*enunciations*'. The individuation conditions ensure that each sentence token belongs to a definite language, has a definite meaning and so definite truth conditions. Iff it has a truth value, it is an enunciation.

A context is taken to be a spatio-temporal zone. In order to avoid complications about a sentence token changing its truth value as it is being uttered, a durationless instant is taken to constitute the precise temporal component of the context, and it is the final instant of the utterance. Odd cases of the speaker's mastering two (or more) languages with identical sentence types belonging to both are solved by resorting to the speaker's «intention», and in case he himself is at a loss about it, by resorting to a disjunction of the separate meanings — and so of the different truth-values. No unuttered sentence is ascribed a truth value, as such an ascription would trigger a regress — we would thus be compelled to take truth to be a relation and go on and on with multiplying the number of places of that relation.

Now, is such a modest attribution of truth-values sufficient for a logical treatment of sentences of natural language? Orayen thinks so. For one thing, logical truth is primarily attributed to sentences in logical languages, that is in formal, artificial languages — and, as we are going to see, Orayen thinks that for such languages truth-bearers are types, not tokens. For another, in so far as logical truth applies to natural language sentences, it does so through translation, and translation requires identity of meaning. So what can be said is that a natural-language pattern or sequence of sentences (of sentence tokens) is a valid rea-

soning iff it is a correct translation of a valid inference of a formal language. The synonymy link is decisive here. What about valid but unused inferences which could be uttered in a natural language? No worry! No need for them. We have our formalized languages to provide us with all our wherewithal. All we need to say is that, should there be a sequence of utterances in a natural language with the same meaning as a given valid inference of a formalized language, it would be a correct (valid) reasoning. Nothing else is required.

Thus Orayen has chosen the most economical solution as far as truth-bearers in natural language are concerned. Only a finite number of truth-bearers in fact. But obviously such a solution does not apply to formal languages. The simplest well-formedness rule, that to the effect that, if  $\lceil p \rceil$  is a sentence, so is  $\lceil \text{not } p \rceil$  would break down — a maximal length, whatever it may be, doubtlessly constraining our utterances past or future. Orayen's solution is to regard types as truth-bearers in formal languages.

Why not statements, propositions or the like? Orayen does not deny that there may be such entities, but he claims that resorting to them is not necessary. Moreover, while the existence of such entities is not only controversial but also fraught with obscurities, sentence types are entities whose existence is admittedly not obvious but whose structural features are clear, since they are isomorphic to their respective tokens, which are material entities whose constituent structure can be studied. Hence, such metaphysical conundrums as surround propositions and the like do not arise concerning sentence types.

Validity, as Orayen is concerned with, is mainly a matter of reasoning or inference. We need to ascribe validity to inference patterns in formalized languages, for they can be infinite in number. As for natural languages, an inference worded in one of them is indirectly ascribed validity in so much as it is synonymous with one of a formalized language which is so.

Orayen distinguishes formal validity from intuitive validity. The former is defined in terms of interpretation in the usual, Tarskian way. (The relationship between such a definition and that, much simpler, in terms of truth-preservation is gone into, the conditions under which both notions of formal validity coincide for a number of formal languages being carefully spelled out.) Intuitive validity is different. It consists in the impossibility of the premises being true and the conclusion false, in virtue of meaning-relations between the terms involved in those sentences. Orayen claims that neither concept of validity implies the other. An inference pattern can be formally valid without being intuitively valid, and the other way round. How is that possible?

That a reasoning can be intuitively valid without being formally valid is brought about by the existence of analytic truths which are not logical truths, namely such as involve meaning links — as e.g. the link between 'being a bachelor' and 'being unmarried' and so on. It is impossible for a man to be both a bachelor and married, so a reasoning from 'Kevin is a bachelor' to 'Kevin is not married' is intuitively valid. Not formally valid, needless to say: no such inference is countenanced by any logical system whatsoever.

On the other hand, an inference can be formally and yet not intuitively valid. Such is the case when ontological implications of the classical first order quantificational calculus are involved. From 'There is no entity such and so' it can be classically concluded that there is some entity which is not such and so. Yet — according to Orayen — the former could be true and the latter false, if nothing existed at all (he assumes such a case to be possible).

Validity of sentences ensues on validity of inference patterns of either kind, through the connection provided by modus ponens and the deduction meta-theorem. Within the framework of a wide range of logical approaches the validity of an inference  $p^1, p^2, \dots, p^n \vdash r$  is interdefinable with that of the sentence 'If  $p^1$  and ... and  $p^n$ , then  $r$ '. (There are some problems here concerning rules to which such a meta-theorem is not generally thought to apply, like universal generalization and the Gödel rule [necessitation] in modal logic.)

Such is Orayen's account. The reader can appreciate to what extent it depends on an intensional approach, with meaning relations carrying an enormous weight not just in connecting natural and formal languages but also providing the link for intuitively valid inference patterns among different sentences of one and the same language.

Such an approach seems to me to be committed to an intensionalism which is enshrouded in obscurities and which in the end does not seem to yield even what it was expected to provide. Orayen himself admits as much, and then he patches up the approach with some minor corrections.

The most apparent source of dissatisfaction is the gulf Orayen digs between natural and formal languages. On that issue almost everybody will agree. Orayen himself does not espouse such a cleavage with a light heart, but as a price to pay in order to avoid enormous complications and uncertainties. Yet, the complications and uncertainties do not vanish with such an account. What is a context? We know that it is a uniquely determined spatial zone at an instant. But no criterion for uniquely determining the extension and length of the zone is offered. If I say 'It is cold here', what is the spatial zone to which my sentence is to apply? The room? A small cranny of the room? The building? The whole city? The country? (As I am writing in Canberra, the whole of Australia?) The Earth? The solar system? The galaxy? Well, perhaps other components of the context give us the clue. Yet, it is not possible then to have the elegant, simple concept of «context» Orayen puts forward, just a spatial zone at an instant. Contexts become more complex entities, perhaps sets or bunches of facts, or situations, or whatever. We cannot rest content with a general consideration that something like that is a context, of course. We need something more specific and enlightening.

Furthermore, instants are very problematic entities, and even if they exist, nothing happens at them. What is said to be true at an instant is best construed as an abbreviated way of saying what happens at all intervals around the instant. If sentence tokens can change their truth value along any of those intervals, taking an instant as the temporal component of the context does not solve the difficulty.

I am not happy either with Orayen's approach to validity. First and foremost, formal validity defined in terms of Tarskian satisfaction applies to some sorts of languages only. How is such an account to apply to combinatory logic for instance? Well, Orayen himself allows for the more appealing idea of truth-preservation to be equalled with Tarskian validity — under some particular circumstances — and with that I have no quarrel. Yet truth preservation is clearly not enough. The pattern «Tweety is a bird; hence Tweety is an animal» is truth-preserving. It is not Tarski-valid because under some interpretation of 'bird' or of 'animal' it is not truth preserving. And anyway it is no logically correct inference. It is a zoologically correct inference.

Which brings us to the issue of logical truth — the subject which features most centrally in Orayen's book. Orayen would want to find a nice, direct account of logical form, but he thinks none is available. Nothing is in fact to be found as regards what logical constants are, except that they are the ones logicians are interested in. We cannot say that a sentence's logical form is something like its underlying or deep structure. Views of that kind were for some time fashionable but whether or not they are correct is an empirical matter, and probably they are wrong. Nor can we say that logical constants are topic-neutral, since there are doxastic, deontic and temporal logics, and the logical vocabulary can be further expanded. Nor can we claim that, should there be no logical system, or no logicians, there would be logical forms and logical truth all the same, except in the sense that, since there are logicians, we, in our world with them and with logical systems, can say that even in worlds lacking both logicians and logical systems there are — relatively to us, so to speak — logical truths. Logical form and logical truth are constrained by logical vocabulary. And logical vocabulary is just a matter of what logicians do. Perhaps some particles are such that logicians had better include them in their vocabulary, but until and unless they do so, such particles don't belong to the logical vocabulary, and such truths as involve them essentially are not logical truths.

What about logical truths in natural language? In the same way as for validity, logical truth is extended from formal to natural languages through meaning links: a sentence of natural language is a logical truth iff it has the same meaning as a logical truth of a formalized language.

No one is going to deny that such an approach is careful and prudent. Too prudent, to my mind. A new problem arises straight away: whom are we to call 'logicians'? This is no trivial issue, and in fact a generation ago such people as were professional academics dignified with the title of professors of logic for the most part taught a very different thing from what nowadays goes by the name of 'logic'. And the reign of classical logic may be short-lived, since new alternative systems are propounded with increasing vigour. Well, perhaps they all constitute logic. No denying that they share many features with classical logic. And what debar new, more daring deviant logicians, from constructing and proposing systems which, from the viewpoint of a classically minded logician, are not logics at all? So, e.g., formal systems which have been proposed as logics of comparatives, and essentially involve phrases like 'very', 'somewhat', 'more... than', 'less... than', 'to that extent that', 'fairly', 'rather', 'completely' and so on. Are they logics? Are those who work on them logicians? Some conservatively oriented professionals say no, since such systems lack the simple proof procedures of more conventional logics. Should the dispute be solved on the basis of «profession consensus» or something of that ilk, doubtless the conservatives would win — for the time being. But are such procedures acceptable, rationally admissible? Don't they beg the question in favour of the more conservative, whatever the issue, whether in logic or in astronomy or in any other discipline whatever?

Most of all, a partly true, partly illuminating answer is better than no answer at all. The idea of topic-neutrality, or generality, is not free from defects, but is it as hopeless as Orayen thinks? Well, perhaps that is so if there are no degrees. But if generality admits of degrees, we can claim that everything the logicians are interested in is general, and very often more general than that in which he is not interested. Doxastic operators are perhaps less obviously general (and I know that in some vacuous, trivial sense, everything is totally general, namely any entity is such that  $p$ , for a true sentence  $\lceil p \rceil$  whatever it may be). Despite

all difficulties, such relations as are denoted by 'and', 'or', 'less... that', 'to the same extent that' etc. are clearly general while such as are denoted by 'brother', 'gravitate', 'increasing the price' etc. are particular. It seems to me that failure to realize such a point is ensuant upon an implicit *all or nothing* approach, which in turn is a sequel of classical two-valued logic.

So, I put an end to the digression on logical truth and come back to the subject of validity. I have contended that the Tarskian concept of validity is parochial. (Well, yes, via translation it can be extended to systems which do not lend themselves to Tarskian interpretation in a direct way; yet the very notion of translation is fraught with further difficulties as Orayen is perfectly aware.) The obvious connection between formal validity and logical truth which — despite problems surrounding rules such as necessitation — is, needless to say, indispensable entails that such problems as beset the notion and extension of logical truth also bear upon the notion and extension of formal validity.

Now, if we accept — with whatever provisos, qualifications and restrictions — the idea that logical constants are general — all in all the most general ones —, then a winsome notion of «formal» validity emerges: an inference pattern is «formally valid», or logically correct, iff the result of linking the premises with conjunction ('and') and then linking such a conjunction with the conclusion through an 'only if' is a logical truth. (Some qualifications are needed in order to accommodate U.G. and the Gödel rule.) The source of the logical correction (or «formal validity» in Orayen's words) is generality. As Ferdinand Gonseth viewed it, logic is the physics of any object whatever. The difference between logically correct and zoologically correct inferences is not that the former alone are truth preserving. Perhaps the former alone are necessarily so, but I do not think we need the concept of necessity here. If we can grasp a useful notion of logical correction without resorting to the contentious (and not very clear) notion of necessity, all the better.

However, Orayen does not want to embark on such a metaphysical or ontological approach. It seems to me that his thought is closer to a view of logic and validity like that of the logical positivists. Other parts of his book, which defend analyticity — vs Quine — confirm that impression.

Orayen's view of formal validity and logical truths in natural language through translation functions subject to meaning-preservation constraints seems to me unattractive. Meanings are so muddy! Moreover, as we are going to see later on — apropos Orayen's criticism of Quine's extensionalism — meaning-preservation, whatever it may be, turns out to be neither a necessary nor a sufficient condition of an adequate paraphrase.

I think there is a more appealing approach, and one Quine has developed and emphasized. Logic is not implemented in an artificial language. Nor are mathematics. We are to view mathematical and logical scripts as schematic representations of some delimited fragments of natural language.

Writing systems fall into several kinds. One of them is that of iconographic systems, which don't represent language but things or situations. Some people take mathematics to be written in an iconographic system. Yet there are cogent arguments to the contrary. Non-iconographic, or glottographic, systems represent language in a written form, but they can be of several kinds. Some of them are holistic, taking either sentences, or words, or other meaningful units as a whole. Some are not so — especially phonetically

oriented scripts. Some are schematic: they do not represent sentences unit by unit, but in a sketchy way, which can be read in a variety of alternative ways. It seems very clear to me that mathematical scripts are of this latter kind. All those distinctions are of course a matter of degree. Yet, there are powerful reasons why mathematics (and set theory and logic) are best regarded as being written in such a way. The passage from pre-theoretical mathematical thought (as was obviously practised by our ancestors for hundreds of thousands of years — people also counted in the palaeolithic era, of course — and as is practiced by illiterate people worldwide) to formalized mathematics ceases to be a mysterious jump. (If mathematics was written in an iconographic system, there would be no passage, one thing would have nothing to do with the other.) Moreover, what about the reading of mathematical formulae in stilted mathematical-school English? Whether stilted or not, it is English. Orayen seems to view such utterances as not belonging to natural language. More generally, he regards utterances of regimented English as not-English. Well, they may have an «un-natural» ring in some sense, but they are part of that natural language, English. Orayen conceives of natural language as what is spoken «naturally» by... whom? Is parliamentary talk also un-natural — a different sort of artificial language? And talk by broadcasting professionals? And thieves' jargon? And children's speech? Well, it seems to me that with such strictures our view of natural language would be most unnaturally constrained and narrow.

On the other hand, logic does not concern itself with language. Logic is not a theory about language at all. The logician is not speaking about linguistic entities in particular. This is obscured because, when put in a first-order framework — which is reasonable, since higher-order calculus raises untractable philosophical difficulties —, the logician uses schemata, and in order carefully to specify his schemata he must describe sentences. Yet that is unessential. The logician's description is neutral towards different views of linguistic structures and linguistic entities. Any careful wording of medical science, sociology or biology would have to resort to similar procedures. Still nobody is going to claim that medical science or biology are concerned with sentences.

It seems to me unsafe to bridge formal-language types with natural-language enunciations (as truth bearers in general and as bearers of logical truth in particular) through meaning equalities. Again, such meaning relations are so obscure and problematic that we had better do without them.

Do we need them? I do not think so. In fact we needn't say what entities the primary truth-bearers are. What is true (or a truth) is that Rome is in Italy. What is logically true is that, if Rome is in Italy, it is in Italy or the Earth is flat. A sentence is logically true to the extent that it says that  $p$ , and it is logically true that  $p$ . This is a schema, not a sentence. By «asserting» the schema we are in fact committing ourselves to asserting every substitution instance thereof which can be formulated with symbols we use and understand.

This, by the way, disposes of the so-called 'Strawson effect' which Orayen discusses at length. For one thing, as Orayen acknowledges, Quine's reply to Strawson — which resorts to reference only, with no appeal to meanings — suffices to avoid drawing false conclusions from true premises in virtue of logically correct rules. (The remaining difficulty about necessity being solved through an extensionalized treatment of modality, i.e. modal realism.) For another, usage of the syntactic «meta-language», so-called, is not part of what logic puts forward, but only of the logician's way of specifying what he has to say. The logician speaks about things, not words.

Since a sentence is true *to the extent that* (not just if), for some 'p', it says that p, and p, we need some account of «saying that». I think that a satisfactory account of that semantical relation involves positing facts, and that facts' existence is what really truth consists in. Yet I do not want to say that, short of a metaphysics of facts, no account of truth is available. Everything depends on the price to pay. If you are content with positing the semantical relation of *saying-that* as a primitive and with leaving its second relatum unaccounted for, then fine! (In fact I am — for our concerns at hand — propounding a minimalistic or deflationary concept of truth; such a concept is not sufficient for all purposes — witness Tarski's point about the third sentence in the leftmost book on the third shelf in my library being true; for our current purposes we needn't speak about sentences. Alternatively we could turn to something like Davidson's account of 'saying that'.)

Facts may be contentious, but I do not see that Orayen is right when he says that they are more obscure than sentence types.

On the other hand, facts can be treated in an extensional way: the fact that Abraham is a father can be taken to be the set of people he begets; and the fact that he begets Isaac can be taken to be a set that only comprises itself — the same being the case for all «intransient actions» and states. Begetting can be taken to be a function which maps Abraham into the function which maps Isaac into the state (or fact) of Isaac's being a son of Abraham. 'And' can denote a function which maps the fact that p into a function which maps the fact that q into the fact that p-and-q. (Rather than functions we could speak about quasi-functions, which may fail to map and which in some cases may yield a value even when no argument is provided.) Are facts in that sense unpalatable for the Quinean?

We can speak of types as a mere *façon de parler*, but if we are bent on taking type-talk literally, what are we supposed to countenance? Sentence-types have parts, constituent structure, don't they? So they are spatial objects, or temporal objects. Where and when are they? At every location where one of the tokens exists? No, not so, for obvious reasons. How large is a type? For instance, a token of 'It is very hot' (in spoken English) lasts for, let us say, several seconds; very slowly said perhaps an hour. There is a minimal duration, not a maximal one — although more and more slowness impairs intelligibility to that point of rendering the utterance un-English. No such thing applies to types. Types are Platonic Forms. The Form of Bed is a perfect Bed, with a perfect Mattress, perfect Sheets and so on; and the perfect Length of a Bed. It is in the perfect Location. No need to dwell on the difficulties besetting such Things. Those surrounding types are exactly parallel.

Of course we can think of types as classes of tokens. But what about uninstantiated types?

I think Orayen had better resort to possible tokens. After all he countenances possibles — else his introduction of necessity into the notion of intuitive validity would amount to little. Possible utterances, possible tokens are concrete. A full account of them may lead us into something like David Lewis's modal realism. (I for one would be glad to embrace such a view, which after all extensionalizes the purportedly intensional modal contexts, and so regains for extensionalism the treasures and explanation power claimed for the notions of necessity and possibility.)

To sum up, I think there are alternatives to Orayen's views which are more congenial to the Quinean and which employ nothing to which Orayen seems to be necessarily

averse. Those alternatives turn out to be much less dependent on intensional talk than Orayen wants to concede — modal talk being extensionalized through modal realism.

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## §2.— Orayen's Criticism of Quine's Extensionalism

Orayen subjects Quine's approach to two main objections, one dealing with the thesis of indeterminacy of translation, IT for short, the other with Quine's extensionalism. I agree — with some reservations — with Orayen's views on IT, so my comments will only focus on the other subject.

Orayen's main argument is that Quine's extensionalism threatens logical truth as applied to natural language. No need here to say why, since as much is obvious for the preceding section. Quine in his reply (pp. 293-7) concedes a lot to Orayen. But in fact a part of what he grants results not from extensionalism but from IT (and of reference). (Orayen seems to me to be so deeply concerned with meaning and intensionality that he regards IT mainly as a threat to meaning-links, as if reference links would be more secure, were IT right.)

Orayen's point is simple and clear. Logic is useless if it applies only to sentences in formalized languages, if therefore nobody can be claimed in ordinary or scientific talk to reason rightly or wrongly according to logical standards. What is directly a logical truth is, e.g., what is said in a formal language with the formula 'p or q if p'. That Marion is 46 or 47 if she is 46 is a logical truth only because such an English sentence is translated into one of a formal language with the same meaning. Failure to admit meaning relations — in particular, synonymy — ensues upon a breakdown of logical truth for natural language.

No logical teaching is interesting nor perhaps even possible if no paraphrase in natural language is available for formulae written in formal languages. But more seriously, it is not just teaching but the very purpose of the logical enterprise what is at stake.

Yet, Orayen acknowledges a difficulty for his account. Not all meaning-preserving paraphrases do. If a logic teacher tries to illustrate 'p or q if p' with examples, he cannot use e.g. 'p or q if: p or q and p' (for some particular 'p' and 'q') even though such a paraphrase would be truth preserving (in fact linking both through a biconditional is a logical truth).

Orayen's solution is to resort to a restricted notion of economic paraphrase. Roughly speaking, the adequate paraphrase has both to preserve meaning and to do so through what we can call the most literal translation available — or something like that.

Orayen has shown us that there is a way of modelling the general procedure of the logic teacher. He does not act arbitrarily. He does not choose his paraphrases in a random way. Something like the principle of economic meaning-preservation is doubtless employed. But what is really enacted here?

Not merely meaning. Orayen concedes that. Meaning and something else. What? Well, of course economic wording, or a maximal degree of literality, or something like that. Yet such a further constraint does not ensue upon meaning preservation. Its rationale is not meaning at all. In fact it seems very clear to me that its ground can only be of a pragmatic sort. But then why not say that *all* the linkage needed is just of a pragmatic sort?

Orayen's qualms could apply exactly in the same way to any other domain. They have nothing to do with logic in particular. You can say that medical truth, or architectural truth, is also threatened by extensionalism. Medical science would be useless if the physician could not put (some of) his considerations and advice in words other people can understand. Yet, are such words synonymous with those of a medical science treatise? Well, with so murky «entities» as meanings are, any claim on such an issue would be most dubious. What is certain is that without some both-ways transfer between ordinary talk and learned speech among professional physicians medical science would not have existed and would not be possible or helpful.

But do we need meanings? The physician uses his paraphrases in a very free way, as does the logic teacher or logic manual author. Yet there are some constraints. Those constraints seem to me pragmatic. What is implicitly required is that, to the extent that a sentence says that *p*, and it is medically (or architecturally, or logically) true that *p*, and putting such a fact in the words forming the sentence is — given the circumstances — adequate, the professional can convey his advice or his teaching by uttering that sentence.

In his reply to Orayen, Quine mentions the research currently developing which aims to implement mechanical translation from English to «logicalese» and conversely with no use of «meanings». Orayen's main objection to such a solution is that it is no good for the extensionalist, in so far as the very same project can be formulated only through intensional concepts.

I am by no means convinced that Orayen is right in this connection. Why is reference not enough? We define a logical vocabulary as the set { 'and', 'or', 'to-the-extent-that', 'less', 'not', 'completely', 'some', 'exists', 'comprises', 'before-than', ... }. Our underlying idea is generality. Then we pick up expressions of usual talk which we take as equal in reference with those ones, and we implement a recursive procedure for much more complicated cases wherein such splitting into units is not easy or is not feasible. (E.g., Orayen stresses that there is no mechanical way of knowing that 'Sam and Jim are Australians' is to be paraphrased as 'Sam is an Australian and Jim is an Australian', since no such paraphrase is feasible for 'Sam and Jim are friends'.) Meaning — Orayen claims — has to be resorted to. Is that so? Well, it depends on what meanings are, but it seems to me clear that meanings «as such» are of little help. What we need is a recursive procedure which is built up on purely syntactic grounds, and which aims at reference. After all, what if the paraphrase preserves reference only, not meaning, whatever that may be? Logic would be none the worse for it, would it?)

Orayen concedes that meaning preservation is not a sufficient condition for a paraphrase to be adequate on two accounts. One is that a further requirement is needed — the one we have referred to as literality or economy, which is pragmatically constrained. The other is that such paraphrases as depend on non-logical synonymies ('unmarried' and 'bachelor' and the like) are of course inadequate in this context. Again, why are we then supposed to need meanings? Why not just reference?

At some point, Orayen clearly says that meanings are necessary for what we can call epistemic reasons. A paraphrase of a logical truth is to count as a logical truth, too, iff we are entitled to be absolutely certain they have the same truth value, and our certainty is grounded on purely linguistic considerations. Yet later on he somehow retracts from such strong claims, taking a less optimistic view of certainty on such matters.

What is important for me here is to discern epistemic necessity, alethic necessity and logical truth. Not all necessary truths are logical truths (in virtue of Gödel's theorem, if for no other reason). Not all necessary, not even all logical truths are epistemically obvious (otherwise no controversy would exist on such matters and no logical mistakes would be committed). Not everything that is obvious is either logically true or necessary, not even if its truth is learnt along with the acquisition of language, as is the case with «My name is So-and-So» or «Mum is my mother and Dad is my father». (The latter sentence is necessarily true or Kripke's view of the essentiality of origins is wrong. But many other sentences which are «analytical» — in the modest sense of being learnt with the acquisition of language — are not even necessarily true.)

Yet I cannot deny that Orayen has a strong point here, even though, after Kripke's arguments, many people now agree that obviousness, logicity and necessity are not co-extensive. Logic seems to be somehow «special». After all, Frege and Husserl claimed that, logic being «apodeictic», no inductive and fallible approach to logical truth would be acceptable. We somehow feel that we need security in our logic. If logic itself is not that certain, what certainty is left?

Well, none. Or no complete and absolute certainty. If we ignore degrees, we are apt to reason in terms of *all or nothing*, and then we hanker after [unblemished] certainty. We harbour security illusions. Gradualism cures us from such anxieties.

To sum up, we again have alternatives to Orayen's intuitionism which seem to me simple and free of any commitment to meanings, which are the mistiest and obscurest [pseudo] things in the philosophical marketplace. We can think of logic as developed directly in natural language schematically represented through symbolic notations, which do not constitute a separate language of their own. We can posit infinite unuttered sentence tokens which exist in possible worlds, each of them being some «part» of Reality. We can base the program of paraphrase on reference, syntax and pragmatics, with no appeal to meanings. And — more contentiously — we can fill in the gaps in our treatment by resorting to facts, which can be accounted in a combinatory way (following F. Fitch's steps, if not necessarily on the details), which is close to a set-theoretical approach in spirit, if not in its articulation.

It would be silly to claim that such alternatives as I am embracing are free from difficulties or that their superiority over Orayen's intuitionism is plain and uncontroversial. Far from it. After all probably more analytical philosophers would agree with Orayen than with the reviewer on such issues. If Orayen's views command such a widespread acceptance, something speaks for them. If the «apriorist» defense of analyticity, necessity, intimate connection between meaning and logical truth and validity, and so on, holds its ground despite Quine on the one hand, Kripke on the other hand, some deep source is bound to exist from which such attitudes re-emerge. All that I reluctantly concede. Yet such considerations must not be allowed to cloud the central point of the foregoing arguments, that we can do without «meanings» by resorting to other conceptual tools which seem to be, all in all, less problematic, less difficulty ridden.

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### §3.— Relevant Logic and disjunctive syllogism

There is perhaps a deep reason why Orayen is interested in relevant logic — RL for short. RL arises from a qualm concerning the classical relation of deducibility, namely, that such a relation depends on what exists, and so is not *a priori*. The ontological (or perhaps alethic) commitments are clear in the case of the quantificational calculus, but there is an implicit alethic commitment in the case of the sentential calculus. CL enforces rules such as VEQ (*Verum e quolibet*:  $p \vdash q \supset p$ ) in virtue of which, from the fact that it is true that  $p$ , it follows that, if  $q$ ,  $p$ ; and hence it follows that  $\lceil p \rceil$  can be drawn as a conclusion from  $\lceil q \rceil$ , for any  $\lceil q \rceil$ . Admittedly such an inferability of  $\lceil p \rceil$  from  $\lceil q \rceil$  is contingent upon a previous assertion of  $\lceil p \rceil$ . All the same, CL countenances such a conditional inferability. Yes, we do not need it, but that is beside the point.

RL takes exception at such commitments. Nothing can be inferred from other things (assertions) in any way which depends on what happens to be true, whether necessarily or not. Inferability is a matter of meaning-connections which can be grasped entirely *a priori*, analytically, without resorting to knowledge of the empirical world or even of necessary truths. Logic, as the pure study of inferability, must be previous to the knowledge of truths. Valid inferences must not be just truth-preserving — not even just necessarily truth-preserving. They must also preserve something else: meaning. The sense of the conclusion has to be included in that of the premises. (Or something like that.)

After the preceding sections of this critical notice, the reader can appreciate why Orayen is prone to find relevantist qualms congenial. After all, his own views of logic's nature are not far away from relevantist considerations. So, he canvasses the arguments of the «founding fathers» of relevantism, Anderson and Belnap — A&B for short — very carefully. (Perhaps he takes them too seriously.) In fact, such arguments do not carry us very far, except as witty illustrations of the general relevantist standard, namely that what happens to be true, whether contingently or necessarily, must not bear on what can be inferred from what, conditionally or not — the purely analytic, or meaning-grounded, link between premises and conclusion being destroyed by such dependence on truth. Yet, unlike the relevantists, Orayen keeps a lingering attachment to some sort of close connection between analyticity and necessity. That connection may remain short of full identity but anyway Orayen tends to think that only all necessary truths are analytical and *a priori*. No such belief is apparently shared by the relevantists, although A&B were not entirely clear on that issue — deep relevantism as developed by Richard Sylvan is far more consequential, claiming that relevance is an intensional but ultra-modal relation. The issue of the relation between necessity and analyticity in the original work of A&B is obscured by their adherence to S4 rather than S5.

Now, Orayen's attitude towards relevantist concerns is — as can be gathered from the above considerations — initially very sympathetic. The relevantists' central idea — that deducibility arises from an intimate, analytical meaning- or sense-relationship — is quite congenial to Orayen's own views. Thus, Orayen goes about discussing relevantist considerations very carefully. The relevantists' appeal to intuitions is to his liking. Yet, he finds a strong reason for not acquiescing to the relevantist rejection of all nonrelevant deductions, i.e. of such inferences as fail to comply with the standards of variable sharing and use-in-proof. The reason concerns Disjunctive Syllogism — DS for short —, which has to be rejected if no non-relevant inference is to be maintained — unless of course some other, commonly accepted,

principle or rule is dropped, e.g. addition, or simplification; Orayen rightly rejects such moves, as do the relevantists themselves.

Let me summarize the way DS lends to nonrelevant deductions — following a much discussed argument of C.I. Lewis, which Orayen scrutinizes in length. From  $\lceil p \text{ and not-}p \rceil$  to infer  $\lceil p \rceil$  and  $\lceil \text{not-}p \rceil$ . From  $\lceil \text{not-}p \rceil$  and  $\lceil p \text{ or } q \rceil$  to infer  $\lceil q \rceil$  (in virtue of DS). Hence, from  $\lceil p \text{ and not-}p \rceil$  to infer  $\lceil q \rceil$ . The last is the rule of Cornubia, usually called Pseudo-Scotus.

Orayen's recommendation amounts to weighing such claim on our intuitions as is possessed both by each step involved in Lewis's argument and by the rejection of those steps. He thinks that D.S. is so intuitively appealing that doing away with it would run against logic's vocation to capture intuitive deducibility connections.

Besides such a general appeal to its intuitive nature, i.e. to its direct obviousness — an appeal which only needs to be confirmed by some sort of statistical account if people's reactions, in particular of how logic students respond to what they are taught — Orayen also musters a different consideration in support of DS, namely that to accept  $\lceil p \text{ or } q \rceil$  commits one to accept, in some sense, that, if not- $p$ , then  $q$ . In some sense. What conditional is involved is a different matter. In general Orayen does not believe that classical horseshoe captures the conditional of everyday language — whether subjunctive or even indicative. So, I take it that the conditional which he thinks is implicitly involved in justifying DS is some special conditional, like the one he thinks is used in mathematics. Yet, if it is a technical connective, belonging to a professional jargon, how is it that every natural language speaker is so committed each time he utters a disjunction? I suppose the answer is that we commit ourselves to claims which cannot be put into adequate words except on the basis of theory-implementation. (Perhaps we all commit ourselves in our use of numerals to very sophisticated, far-reaching and hard-to-prove theorems of number theory.)

Anyway, that separate argument — the invocation of an implicit conditional where the first disjunct, upon being negated, becomes the protasis, the second disjunct becoming the apodosis — is not necessary for Orayen's purposes. If DS is intuitively correct, that is enough.

But is it correct? Well, Orayen — unlike most writers on these issues — is extremely careful, and he hedges his sentences. He claims only that for some negation DS is valid, and hence so is Cornubia. And this I wholeheartedly concede. But what negation?

Orayen admits that there may be other negations, but he thinks that the usual negation in science and everyday speech is classical, and that DS and Cornubia are applicable to that negation. Well, my comment is that it depends on what the usual negation is assumed to be. If it is what is most frequently conveyed by a mere 'not', I disagree. If, however, it is what is meant by phrases like 'not... at all', 'by no means' or 'It completely fails to be the case that', then I am sure Orayen is right. As for when it expresses a negation weaker than the classical one, that is a difficult matter. I take it that in our spoken language we can use prosodic means unavailable in written English, some of which may be [part of] strong-negation markers — in addition to contextual factors.

The problem is whether such an exclusion as is admittedly converged by negation is always a strong or total exclusion, or if it can admit of degrees. If the former in the case, each utterance of 'Yes and no', 'I did and I didn't', 'He was and he wasn't', and so on, are

either utterly illogical or else bad ways of putting a logically unobjectionable message. If, however, exclusion admits of degrees, what is espoused by 'not' may be non-total exclusion. Thus, 'not-p' may denote a state of affairs which does not bear to the state of affairs that p a relation of utter incompatibility, but instead one of not-necessarily-complete exclusion — partial exclusion. To the extent that 'not-p' is true, 'p' is not true, and the other way round.

Should such a suggestion be acceptable, we would have a clue to why and when DS is warranted. Only whenever negation is strong — whether a strengthening 'at all' or the like is explicit or only implicit — is DS applicable.

Such a motivation for discarding [unqualified] DS is of course entirely different from the relevantist qualms on this issue. Yet, some odd similarity emerges. If we espouse degrees of truth, we need a connective expressing something like «to the extent that», and a careful study of such a connective shows that it is bound to have at least all the properties of '→' in A&B's relevant system **E** of entailment — and in fact some further properties, too, since **E**'s arrow is too weak. Likewise, upon such an approach we need some inference relation — not necessarily the only one — in virtue of which the conclusion is not less true than the falsest premise. Again, implementing such a relation bears a close similarity to A&B's natural-deduction account of entailment (again with some important strengthenings).

So my provisional conclusion on this debate is that Orayen is right against the relevantist scruples, but only conditionally and qualifiedly so. DS obtains for some negation — strong negation — but not for every negation — Orayen concedes as much. I surmise that the most common use of negation is not that strong. And if a gradualistic approach to truth has real merit, the relevantist (or more exactly «entailmentalist») enterprise, duly strengthened, is not as ill-advised as that, after all.

I'll bring this discussion to a close by touching on a minor point. On p. 233 Orayen considers A&B's claim that DS is applicable only whenever 'p or q' contains an «intensional» 'or' in virtue of which the disjunction in question can be paraphrased as «Were it not the case that p [it would be the case that] q». Orayen elaborates on an illustration by E. Adams. From 'Either Oswald killed Kennedy or somebody else did' and 'Oswald didn't kill Kennedy', we should conclude that someone else killed him. Yet — Orayen claims — we would'n draw from the premise the conclusion that, if Oswald had not killed Kennedy, somebody else would have done so — unless we think there was a conspiracy, or that Kennedy was fated to be killed by Destiny, or something like that. But is the appropriate subjunctive conditional rightly stated? Why not this other way: 'Were it not the case that Oswald killed Kennedy, it would be the case that somebody else did it'?

Anyway, this comment is of quite secondary importance for my main purpose in this section, which was that of showing that, even if Orayen is right against the relevantist arguments, yet DS may need to be hedged.

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#### §4.— Castañeda's Guises

Orayen's book's last chapter (chp. VI, pp. 263ff) deals with problems of logic and existence. Orayen discusses Meinong's original approach, Russell's objection and one

among the several neo-Meinongian approaches currently available, namely Castañeda's guise theory.

Orayen's main objection to Castañeda's theory is that it leads to a wrong counting. One of the principles of Castañeda's theory is that the expression «the entity that p» is the only entity which has only one characteristic, namely that of being such that p.

Indeed Castañeda distinguished several ways of having a property (several predication relations) and several [quasi]identity relations — identity proper, consubstantiation and consociation, the last one being left aside in the present discussion. A *guise*, something denoted by a definite description, internally has only such properties as are ascribed to it in (or by) the description, but externally has all properties of any guises with which it is consubstantiated. Now, only existent entities are consubstantiated (with themselves and with other entities). (In order to overcome certain infelicities which stem from such an approach concerning non-existent entities — such as, e.g., that nothing could be ascribed to a non-existent entity except what, word for word, served to characterize it in the first place — Castañeda resorts to consociation; as announced, that side of his approach lies beyond the scope of our present comments.)

There are serious problems about Castañeda's guise theory e.g. whether *the entity that is a horse, that flies, that eats rabbit-meat, that never sleeps* is the same (exactly the same entity) as *the horse that flies and eats rabbit-meat and never sleeps*. Also such problems — already discussed by a number of critics of guise theory — as arise concerning descriptions («second-order descriptions» perhaps) which contain the technical terms which are used in the theory. Castañeda seems to be led to something like Frege's plight about *the concept [of being a] horse*. An ordinary entity, like the Eiffel Tower, is a system of guises (Castañeda sometimes calls it a *set* of guises and Orayen comments on that unfortunate application of the word; in fact, 'system' is, if vague, more appropriate here than 'set', although of course an axiomatic treatment has then to be propounded for «system theory», in order for us to be able to assess what one is committed to when he regards an ordinary individual as a system of guises). One of those guises is *the tower built by Eiffel*; another one *the highest building in Paris* (or was it?), etc. Now, what about *the system of guises which has only all properties had by at least one of the guises consubstantiated with the Eiffel Tower*? Let us abbreviate that phrase as ' $\delta$ '. If  $\delta$  is one of the guises making up the [ordinary entity] Tour Eiffel, then a number of odd results ensue:  $\delta$  internally has the property of being the ordinary entity Tour Eiffel, a system of guises; one of that system's components is the system itself, which badly calls for a treatment allowing non-well-founded systems; furthermore,  $\delta$  internally has all the properties externally had by the Tour Eiffel. With more convoluted descriptions, worse would follow. A way out is to say that such descriptions do not describe what they seem to; but then what about the initial point, namely that each guise internally has the property which characterizes it?

Orayen's main objection to Castañeda's theory is closely related to the foregoing comment. Orayen's point is that guise theory leads to counting trouble. Thus if we know that at this tomb are the remains of the English writer who made methodism world-wide famous, the woman whose pen-name was 'George Eliott' and the author of *Silas Marner*, we say that only one entity is buried there, Mary Ann Evans. Yet Castañeda is bound to agree that there are three, an English writer, a woman and the author of *Silas Marner* — and infinitely many others of course.

Castañeda's initial reply to that problem was the converse to our just considered way-out to the problem of «the system of guises such that...», viz. that sometimes an ordinary definite description does not denote the guise it would normally denote, but the system the guise is a member (or a «part») of, i.e. the system of all the guises consubstantiated with the guise in question. Orayen (p. 282) points to two difficulties with such a solution. First its *ad-hoc*-ness. Second, and more seriously, what about the descriptions 'the system of guises consubstantiated with the woman whose pen-name was 'George Eliott'' and 'the system of guises consubstantiated with the author of *Silas Marner*'? According to guise theory they denote different guises. Which brings us back to our previous concern over descriptions which use the very same technical terms the theory avails itself of. But, if it is true that those descriptions denote different entities (guises — in fact none of them denotes a system of guises!), then the very same clarification sentence 'Sometimes the description 'the author of *Silas Marner*' denotes the system of guises consubstantiated with the author of *Silas Marner*' is a sentence that says something different from what it was meant to, and in fact sometimes surely false according to Castañeda's lights. Thus the clarification cannot be uttered within guise theory with the intended meaning — as Frege could not say within his own framework that the concept of being a horse is what is denoted by the verbal phrase 'is a horse'.

Castañeda, in his reply, contained in Orayen's book (pp. 303-5), devises a procedure through which he ensures that for any property P there is an equivalence class, A, of guises which picks up just one guise out of a system of mutually consubstantiated guises with [externally] property P.

Incidentally, it seems to me there is a slip in Castañeda's formulation of condition (ii): if what he wanted — as Orayen says, in footnote, 23, p. 285 — was to ensure that A comprises only one guise of each system of mutually consubstantiated guises which are P, then a protasis is missing to the effect that the guises are different; namely, Castañeda's condition (ii) is ' $\forall g^1, g^2 (g^1 \in A \& g^2 \in A \supset \neg C^*(g^1, g^2))$ '; I think that either he was using Hintikka-like exclusive quantifiers, or he meant ' $\forall g^1, g^2 (g^1 \neq g^2 \& g^1 \in A \& g^2 \in A \supset \neg C^*(g^1, g^2))$ ', i.e. no two different consubstantiated guises are members of A — in other words ' $\neg \exists g^1, g^2 (g^1 \neq g^2 \& g^1 \in A \& g^2 \in A \& C^*(g^1, g^2))$ '. A different problem is that there is an implicit appeal to something like the axiom of choice here. A detailed axiomatization of system theory is needed in order for us to see what is afield.

Through such a device, we may ask how many entities belong to such a class A and [externally] have a separate property Q. By so doing we'll solve the counting problem in an obvious way. The answer will obviously be: one.

Orayen's objection (pp. 285-6) is that such a device yields the correct and expected counting result, but paying the price of debarring us from naming what is thus counted. We know that there is only one entity which is the entity belonging to the class A of guises meeting Castañeda's three requirements and externally having the property of writing *Felix Holt*. But such an entity is a guise, which internally has the property of belonging to the class A of guises meeting Castañeda's three requirements and externally having the property of writing *Felix Holt*. Now, by counting guises we wanted to count guise systems — that was the very purpose of devising the A classes in the first place. Can we name those systems? No, we cannot. Each phrase we may happen to coin for the purpose turns out to denote a guise.

There is a *coda* to Castañeda's reply that Orayen refrains from going into. Castañeda points to an enrichment of the formal language in which guise theory is formulated, consisting in the addition of a new sort of variables ranging over guise systems. A categorial predicate 'M' can also be added, which — although Castañeda does not dwell on specifics here — would be such that for any new variable, 'm', 'm ∈ M' (or 'Mm') would be «analytic» — or something like that —, whereas apparently — since predicate 'M' is categorial — for any variable of a different sort, 'x', 'x ∈ M' (or 'Mx') would be ill-formed.

Again, such a solution shares all the ineffability problems known to afflict type-theory and many-sorted languages. Nothing really new. The *concept-horse* trouble is still with us. Pluricategorial ontologies are ineffable, all of them. So simple a sentence as 'guises are not systems of guises', which Castañeda's reshuffled theory obviously intends to espouse, cannot be said within the theory. Any new reshuffling will entail similar problems one stage up.

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### §5.— Conclusion

There are of course lots of extremely interesting discussions in Orayen's book which I have abstained from commenting on, out of a sense of space limitations. The reader has realized that my line is not Orayen's. Yet I have read only a few books as thought-provoking as this one. If you are not indifferent to the problems of philosophy of logic, read it. Apparently, an English translation is in prospect. Meanwhile, that may be a good opportunity to study Spanish.

The main merit in a book is the author's. Nevertheless, let me also praise the publisher, the National University of Mexico, which deservedly has acquired a high reputation for the excellent work in analytical philosophy which is done there — of which this book is a telling example.