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OUTLINE OF A THEORY OF MEANING : SEMANTICAL AND CONTEXTUAL

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1. *Three approaches to meaning.*

There are several reasons, to some of which I shall refer later, to take meaning serious, i.e. to take it as distinct from syntactically expressible formal properties of linguistic entities, as distinct from denotation or extension, and the like. Among the possible approaches to the study of meaning three seem to be especially important for the philosopher :

(a) The study of the meaning of linguistic entities with respect to communication processes properly. This approach is concerned with questions about the relevant belief and knowledge contents on the part of the speaker and hearer respectively, with questions about how to arrive at a consistent interpretation of a "text", etc.

(b) The study of the meanings of sentences, respectively propositions, in terms of the observations and actions of the person (individual, community) who accepts or beliefs them to be true (connected with the dispositional interpretation of belief). Here the meaning of a sentence p is seen as (or at least seen in relation to) a function of the verification procedure for p — a procedure which will usually contain observations as well as actions — and a function of the actions that a person will or will not perform, relative to a problem situation and relative to a set of background beliefs, according as he does or does not believe (accept) that p.

(c) The study of the meaning of linguistic entities with respect to parts of the world (facts, objects, relations,...) or possible parts of the world (more accurately : parts of possible worlds). It is with this approach, i.e. with semantics, that we shall mainly be concerned in this paper.

It goes without saying that the philosopher is not interested in determining the meaning of a given sentence as such. He is interested in general rules, systematizing devices, governing mechanisms, the nature and properties of the notions appearing in the theories of meaning, and the like.

Since some adherents of approach (a) consider the other approaches as misguided, and since some others incorporate part of (b) and reject (c), it seems worthwhile to say a few words in this connection. In my opinion there is no such thing as *the* meaning or *the* set of possible meanings of a sentence. More accurately, if one tries to distinguish between the set of possible meanings of a sentence on the one hand, and the (linguistic and non-linguistic) context which on a given occasion determines further the meaning of the sentence on the other hand, then the set of possible meanings has to be universal and the determination of the meaning of the sentence, as occurring on the given occasion, lies completely with the context. The reason for this is not only that any sentence may be used to express almost anything, given an appropriate context, or that languages are in constant evolution, but also that we have a multiplicity of private languages, one for each language user. Of course a number of people believe in the myth that there are such animals as English or Dutch. This belief provides from the fact that human beings develop their language in contact with other human beings, and hence that certain human beings are able to understand to some extent parts of the private language used by other human beings. However, from the fact that certain human beings are able to communicate with one another in a somewhat successful way should not be concluded that there is a common language which is used by each of them. Some forms of platonism may be defensible, this one seems not.

It does not follow, however, from the above that approaches (b) and (c) should be rejected. Once a context is determined, a set of meanings (or a "disjunction" of meanings) corresponds to each sentence used in this context. These meanings should be analyzed by means of (b) and (c). In this connection it seems to me that only (c) may lead to the required full-blown analysis of the meaning of linguistic entities. I do not intend to say, however, that approach (b) is superfluous. The relations between sentences on the one hand and actions and observations of a subject on the other hand ensure that the sentences are linked to reality through their link to the empirical data. Furthermore, approach (b) will lead to a criteriology of meaning, i.e. it will enable us, if sufficiently elaborated, to justify hypotheses about the meaning of certain sentences for a given language user and in a given context. But the meaning of a sentence

— and by this I shall always mean : in a given context — is neither its verification procedure nor a set of dispositions to act. (Remember in this connection the failure of strict operationalism.) Specifically for a descriptive sentence, its meaning is a possible state of affairs, something that is or is not the case in a possible world. Hence, the analysis of meanings requires approach (c). Of course meanings, or at least some meanings, do not exist; they exist even less then constructs in the sense of Mario Bunge (1974). Some readers might find approach (c) unjustified for this reason. Yet, approach (c) seems the only one to me which might enable us at this moment to solve certain urgent problems. If approach (c) would indeed turn out unjustified and if a better approach would come at hand, then no doubt a number of major results arrived at by means of approach (c) will have to be incorporated in the new theory (remember Karl Popper's (1959)). In this sense there can, at least for the time being, be no objections against approach (c).

In the rest of this article I shall only be concerned with approach (c), viz. with some aspects of the theory to which such an approach may lead. Furthermore, I shall only consider descriptive sentences. In a sense the semantics of descriptive sentences is basic to the development of a general semantics, and descriptive sentences are no doubt the easiest to start with. I also shall prefer to speak about sentences and words, rather than about propositions and concepts. The reason is that I believe it advisable to be a nominalist whenever one can. It allows one to change one's mind without loosing anything at all.

2. *A semantics for meaning in PC-languages.*

In my (1975a) I presented semantic definitions of several meaning notions that I consider to be of first rank importance for the solution of certain philosophical problems By a 'meaning notion' I mean a notion from the theory of meaning properly, not, e.g., from the theory of reference. As the presentation of the semantics was technical and concise I shall first of all try to describe it here in a somewhat more intuitive way. Meanwhile I shall try to elucidate the views that are behind it.

We shall only consider sentential (or "propositional") languages, i.e. languages that may be described in such a way that their smallest components are sentences. The primitive elements (their set will be denoted by K^O) of our semantics will be considered to be elementary (possible) facts. These facts are elementary and "positive"; they are not language dependent; they are parts of possible worlds and not necessarily counterparts of sentences of certain languages. The meaning of a sentence is a compound (see next paragraphs) of such facts. To each sentence of a sentential language corresponds a meaning; the converse does obviously not hold.

Let us first restrict our attention to languages that have the logical structure of PC (the two-valued propositional calculus); i.e. to languages of which the considered logical connectives are all definable within PC. In order to construct a semantics for such languages we define a Boolean algebra $\langle K, \times, - \rangle$ in which K is the set of meaning elements, containing K^o as a proper subset, $\times$ is the product and $-$ is the complement (not to be confused with the set-theoretical complement, as in $\overline{S}$, which belongs to the metalanguage). Furthermore, we define in the usual way : + (the sum), 0 (the zero element) and 1 (the universal element). All non-primitive elements are called compound. Both primitive and compound elements are meaning elements, but only the primitive elements may be considered as facts. Compound elements are not compound facts, but compounds *of* facts.

Not all elementary facts are independent of each other. But the dependencies between them are easy to describe : there are certain sets of facts, called families, such that exactly one member out of each family is the case. Suppose, for the sake of an example, that it is an elementary fact that some object has a certain mass. Then there is an (infinite) family of possible facts, each of which is that the object in question has this or that specific mass. That exactly one member out of each family is the case may be stated as follows : the sum (+) of all members of a family is identical to the universal element (1) and the product ($\times$) of any two members of a family is identical to the zero element (0). It follows, furthermore, that the complement of a member of a family is identical to the sum of all other members of that family.

To each sentence p we assign a meaning element. The obvious restriction is that, if a is assigned to p and b is assigned to q, then $-a$ should be assigned to $\sim p$ and $(a \times b)$ should be assigned to $(p \& q)$; hence, $(a+b)$ should be assigned to $(p v q)$, etc. In other words, the meaning of the negation of a sentence is the complement of the meaning of that sentence, etc. To take a simple example : if the meaning of p is the elementary fact a, then the meaning of $\sim p$ is $-a$, i.e. is the sum of all other elementary facts that belong to the same family; $\sim p$ means then that another (non-specified) elementary fact, that belongs to the same family as a, is the case. Other example : if a and b are primitive meaning elements and are the meanings of p and q respectively, then the meaning of $(p \& q)$ is the product of a and b, i.e. that both are the case.

At this moment we are already well equipped to give semantic definitions of those meaning notions that we shall call the traditional ones. p and q *have the same meaning* is defined as : the meaning of p is identical to the meaning of q (the same element is assigned to both); p is *logically necessary* (is true for logical conceptual reasons) : the universal element is assigned to p; p is *logically impossible* (false for logical conceptual reasons) : the zero element is assigned to p; p *implies logically* q : the meaning of p (M(p)) is included in the meaning of q (M(q)), i.e. $M(p) \times -M(q) = 0$. Analogously we may define : p is logically possible, p is logically contingent, etc.

Apart from the traditional meaning notions I shall define some non-traditional ones. In my opinion the latter are far more important then the former; they are also more fundamental and more typical for a theory of meaning. Yet they are not defined by other authors, or else they are defined in an abortive way (see section 4). In order to formulate the semantic definitions of the non-traditional meaning notions some preparatory work has to be done. The meaning elements $((a+b)\times c)$ and $(a+(b\times -c))$ will be called Boolean functions of a, b and c, and may be written respectively as, say, $f_1(a,b,c)$ and $f_2(a,b,c)$. Suppose now that c is a member of the family $\{c, c', c''\}$. Then $f_2(a,b,c) = (a+(b\times(c'+c'')))$;let the latter be $f_3(a,b,c',c'')$. Let us call Boolean functions such as f_1 and f_2 *positive* (f_2 is not positive). Now let $f_4(a,b,c)$ be $(a\times((b+c)\times c))$ and let $f_5(a,c)$ be $(a\times c)$. Obviously $f_4(a,b,c) = f_5(a,c)$. We shall say that f_5 is a *maximal* function, whereas f_4 is not. (In a maximal function no element is "superfluous".) Let us from now on use the names F_1, F_2, ... for *maximal and positive* Boolean functions. (It goes without saying that the above notions may be defined in a technically respectable way.)

Here then are the non-traditional meaning notions. That p and q are *strictly independent of* each other means, intuitively, that they have nothing in common as far as their meaning is concerned (e.g. : 'John has a beard' and 'Mary is tall'); in other words, that they do not convey any information about each other. With respect to our semantics this means that p does not contain any information about any family of facts about which q contains information. This comes to : if the meaning of p is $F_i(s_1, ..., a_n)$ and the meaning of q is $F_j(b_1, ..., b_m)$, then no a_k $(1 \leqslant k \leqslant n)$ belongs to the same family as a $b_l (1 \leqslant l \leqslant m)$. In the same way we may define : p is *positively relevant to* q, p is *negatively relevant to* q, p is *neutrally relevant* to q, (i.e. positively with respect to some families and negatively with respect to some others), and *the meaning of* p *is a part of the meaning of* q.[1] All these notions are defined, albeit in another guise, in my (1975a). I shall not present any definitions here but rather try to make the notions intuitively clear for the reader by offerring some examples. Let p, q, r and s be sentences of the same language and suppose, for the sake of simplicity, that they are all strictly independent of each other. We have then :

(i) Strict independence (a relation which is symmetric and nontransitive, and which is irreflexive with respect to logically contingent sentences) :[2]
(p&q)⊠(r&s)
(p&q)⊠(r&~s)
(pvq)⊠(r&(rvp)) (the latter formula is equivalent to r)
((pvq)&(pv~q))⊠((pvq)&(~pvq))

(ii) Positive relevance (a relation which is symmetric and nontransitive, and which is reflexive with respect to logically contingent sentences) :
$(p\&q)I^{+}(p)$
$(p\&q)I^{+}(p\&r)$
$(pvq)I^{+}((pvr)v(r\&{\sim}q))$ (the latter is equivalent to (pvr))

(iii) Negative relevance (a relation which is symmetric, nontransitive and irreflexive) :
$(p)I^{-}({\sim}p)$
$(pvq)I^{-}(rv{\sim}q)$

(iv) Neutral relevance (a relation which is symmetric, nontransitive and irreflexive) :
$(p\&q)I^{o}((p\&r)v({\sim}q\&s))$
$(p)I^{o}((pvr)\&({\sim}pvq))$

(v) Part-whole relation for meanings (a relation which is nonsymmetric, viz. asymmetric unless both arguments are logically equivalent,[3] transitive and reflexive) :
(p)P(p)
(p)P(p&q)
(pvq)P((p&r)vq)
~[(pvq)P(p)]
~[(pvq)P((pvq)&(pv~q))]

For definitions, further examples and comments on these meaning notions I refer the reader to my (1975a). Notice that these notions are strictly semantic in nature; they concern meaning, not syntactic form. Also the examples were taken from a peculiar kind of language (certain primitive sentences strictly independent of one another), but the notions themselves apply to any language.

Notice that we have arrived at semantic definitions of both the traditional and the non-traditional meaning notions without even mentioning such notions as truth value or possible world. Of course, meaning is related to truth and to truth-in-a-possible-world, but meaning is more primitive. For this reason it is an advantage of the present theory that the meaning notions may be defined with respect to meaning elements alone. I shall now show that the semantics may be extended so as to incorporate truth-in-a-possible-world. The relation between the meaning notions on the one hand and possible worlds on the other hand is exactly as one would expect it to be, and agrees with the definitions from the literature as far as the traditional meaning notions are concerned.

The introduction of possible worlds (as derived elements !) is easy enough. Exactly one elementary fact out of each family is the case in a possible world. Technically this comes to : to each world is assigned a meaning element that is identical to a product of exactly one primitive element out of every family. (Alternatively : a world is defined as such a product; or as a maximal consistent set of primitive meaning elements.) A sentence p is true in a world w_i if and only if certain facts which make p true are the case in w_i. Whence the definition : p is true in w_i is defined as : the value (product) assigned to w_i is included in the meaning of p ($v(w_i) \times -M(p) = 0$). Each of the following statements, which correspond to the definitions in the literature, may be proved : p and q have the same meaning iff (if and only if) they are true in the same worlds; p is logically impossible iff it is true in no world; p implies logically q iff q is true in all worlds in which p is true. The corresponding equivalences for the non-traditional meaning notions may be found in my (1975a) (but see the next section in this connection).

3. *Some further comments on the semantics.*

The reader might object that this theory of meaning is subject to several paradoxes. E.g., all logically necessary sentences have the same meaning. This seems not desirable since, e.g., the different axioms of PC, which are all logically necessary, must have different meanings if it is to be explained why we get another logical system by leaving one of them away. It also seems undesirable if we want to explain the sense of deriving a theorem from the axioms, or if we want to explain why a certain rule of inference, and not another, enables us to derive a certain conclusion from a set of premisses. The paradox disappears, however, if one is willing to accept that *meaning varies with contexts.* The specific semantics presented in the preceding section characterizes the meaning notions with respect to a specific set of contexts. All this will become clear in section 5.

In the preceding section I have already referred to the fact that the meaning notions, although they are not derived from truth valuations in possible worlds, are closely related to them. In this connection it is worthwhile to mention that a sentence may be characterized by a set of worlds, viz. by the set of worlds in which it is true. The traditional meaning notions may all be defined in terms of such sets. However, the non-traditional meaning notions cannot be defined in this way; their definitions require essentially a reference to meaning elements as such. (Compare the definitions in my (1975a).) Perhaps is this one of the reasons why they were never defined adequately in the literature. It should also be noticed that the meaning of a sentence is not the fact to which it refers in the actual (or in any other) world. The meaning of a sentence is in general a Boolean function of elementary facts. Not these functions, but the elementary facts are or are not the case in a world. A sentence is true in a world if in this world certain facts are the case, which guarantee the truth of the sentence (the sentence is logically implied by the description of these facts, *if* such description occurs in the language). And the facts that make a sentence true in one world may be different from the facts that make it true in another. Simplistic example : that I am younger than fourthy is true in this world but is also true in a world in which I would be five.

The meaning notions mentioned in section 2 belong to the *metalanguage*. It follows that it has no sense to iterate them (e.g., 'it is logically true that it is logically true that p') unless the nesting modality belongs to a higher metalanguage. If we consider the modal logics between S.0.5. and S.5 (including S.1, T, etc., and restrict their formulas to those containing no iterated modalities, then they all boil down to a logical system which may be axiomatized by the same axioms and rules as T. The traditional meaning notions have the same logical structure as the modalities of this system.[4] No wonder, then, that the semantic definitions of the traditional meaning notions in terms of truth-in-possible-worlds agree completely with the semantics for these modal logics, as initiated by Kripke. Of course, the "accessibility relation" becomes non-functional (it characterizes the properties of iterated modalities); but its intuitive meaning with respect to "logical necessity" — or with any other necessity for that matter — has never been made very clear anyway.

It follows from the above that I do not quite understand the justifiability (or the extra-technical rationale) of the move made by Carnap in the last chapter of his (1947). After having defined the L-concepts (L-truth, L-implication, etc.) in his specific quasi-semantic way — and the L-concepts belong to the metalanguage — Carnap introduces modalities (necessary, possible, etc.) in the object language (his S_2). Each modality *corresponds* (Carnap's terminology) to an L-concept, but, as he correctly notes, this correspondence cannot be used as a definition, and not even as a translation relation. Carnap explains all this quite clearly (o.c., p. 176), but does not tell us what might be the use of a modal language (containing ***logical*** modalities only) unless as a (relative) metalanguage; and in such a language iterated logical modalities do not make sense. Hence, what might be the sense of Carnap's demonstration that S.5 follows from the above correspondence (and his relevant "rule of range")? The traditional meaning notions as defined in this paper correspond to Carnap's L-concepts. There are two main reasons why they are not identical: Carnap defines the L-concepts quasi-semantically with respect to the language-dependent state-descriptions (he gave up this approach later, see his (1971)), and he does not define them with respect to meaning elements but with respect to state-descriptions (which correspond to possible worlds).

Let me finally add that the above semantics may be extended trivially in such a way as to apply to predicative languages. However, several philosophical problems arise in this connection, and it would lead us to far to discuss the matter here.

4. *Why this kind of semantics ?*

The main reason for introducing the semantics of section 2 is that it enables us to define the non-traditional meaning notions. In my (1975b) I have shown that these notions are needed to solve certain problems in the philosophy of science (e.g. concerning explanation). I have also shown that the semantics enables one to define the notion of verisimilitude in such a way as to overcome the objections against Popper's definitions (see my (1977)[5]).

In general the semantics prevents us from falling into one (or both) of two traps. One falls in the possible-worlds trap if one reduces meaning to a function of possible worlds and truth valuations. One falls in the syntactic trap if one reduces meaning to syntactic relations between linguistic entities, or if one is misled by such relations. The whole literature on explanation, from Hempel to Stegmüller, fell in the syntactic trap (see my (1975b)). Popper fell in the syntactic trap in trying to define verisimilitude (see my (1977)). And so did Wesley Salmon in trying to define complete independence (he had in mind what I call strict independence; see my (1975b)). Mario Bunge (1974, p. 125) tries to define "intensional independence", and he too falls in the syntactic trap — his thinking about constructs instead of linguistic entities was no help in this connection. I shall briefly explain what is wrong with his definition. It goes as follows :

P is intensionally independent of Q $=_{df}$ $I(P) \cap I(Q) = \emptyset$
where P and Q are either statements or predicates (both meant as constructs) and where $I(P)$ is the intension of P. Now $I(P) \cap I(Q) = I$ (PvQ); and the latter is only empty if (PvQ) is a tautology. It follows that, on this definition, P is intensionally independent of Q if and only if *they have no non-tautological consequence in common.* Hempel (1965) had already tried to use the criterion printed here in italics, and went wrong with it. Bunge seems not to realize that his definition leads to consequences as the following : 'Frege had a beard' and 'Russell had a long nose' are *intensionally dependent* (for 'Frege had a beard or Russell had a long nose' is not a tautology). If Frege's beard is intensionally dependent on Russell's nose, they better take intensions to the moon for a while.

5. *Meaning contexts.*

In this and the following sections it will be clarified how the aforementioned semantics has to be "generalized" in order to escape certain limitations. The result of this generalization will not be a single semantics, but will be a (potentially infinite) set of semantics. A general theory will have to articulate the general characteristics of these semantics, to indicate what the choice of a specific semantics depends on — and the answer will be : on a context —, and finally to describe how a semantics should be constructed given a context. Of course, all this cannot be worked out in a short article as this. I shall nevertheless try to give the reader a fairly good idea of what the complete theory will look like by means of an informal discussion of some technical aspects and of the underlying view.

When I use the term 'context' from now on, I shall abstract from the determining pragmatic factors (speaker, place, time, ...) and restrict the discussion to the meanings properly of linguistic entities in a context. Furthermore, since I have already restricted the discussion to the descriptive meaning of sentences, I shall only deal with contexts in which inference is possible. Finally, I shall consider a context as characterized by a language and a more or less extended characterization of the meanings of entities of this language. (Some readers might prefer to call this a set of contexts instead of a context.)

I now come to the heart of the contextual view. From the above characterization of a context it follows that in every context is determined : (a) a set of sentences (belonging to the object language) that are true (respectively false) by virtue of the meanings of linguistic entities, and (b) a set of rules of inference (stated in the metalanguage). The sentences that are true for reasons of meaning will be called *contextually necessary*, those that are false for the same reasons will be called *contextually impossible*, and the other sentences will be called *contextually contingent*. Only contextually contingent sentences are *contextually informative* (contextually relevant). The members of the two other sets are *contextually uninformative* (contextually irrelevant). If 'either John is a philosopher or he is not' is contextually necessary, then this sentence is contextually irrelevant; stating it in the context does not make sense. It is obvious that there is a connection between the division of sentences into contextually necessary, impossible and contingent on the one hand, and the set of rules of inference on the other hand; see my (1975b).

The determination of a context corresponds to a restriction on the considered set of worlds, viz. to a restriction to those worlds in which all contextually necessary sentences are true, all contextually impossible sentences are false, etc. (As will become clear later, the statement in italic is itself derived from a more fundamental statement.) The semantics described in section 2 already presupposes such a restriction; e.g., no world in which, for some p, $p\&\sim p$ is true, belongs to the set of considered worlds (such worlds will be considered in certain contexts; see later). The semantics of section 2 expresses the common features of all contexts in which a PC-language is used. In a specific such context, i.e. in a context in which the meanings of at least some sentences become specified, the considered set of worlds is further restricted. All this will become more clear in the following section.

Just to avoid confusion about the notion of a context I add the following comments. It is obvious that we may pass from one context to another. Suppose that two persons are discussing and that each of them presumes to understand the meanings (in both the popular and the contextual sense) of the expressions as used by the other. Then it turns out that there is a misunderstanding on the part of the hearer of a term as used by the speaker. The hearer states this, and the speaker starts to explain what he means by the term. At this moment there is a shift in context : certain contextually necessary sentences become contingent in the new context; the description of the "meaning" (in the popular sense, not in the contextual sense) of the term becomes contextually informative; the set of considered worlds is broadened. Other example: one applies a set of "operational definitions" ('operational criteria' might be a better name) in a certain experimental situation, arrives at a contradiction, passes to a context in which one of the operational definitions is replaced by another one, and then passes to a context in which the new set of operational definitions is applied and in which the experiment is continued. In all such contexts one passes to a "higher" context in which "meanings" (in the popular sense) are explained and in which less rules of inference are taken to hold, and then returns to a "lower" context.

This contextual view on meaning is at variance with the popular view, viz. that we can neatly distinguish between statements (respectively a theory) about the meaning of linguistic entities and statements (respectively a theory) about the world. As one knows, the popular view was shown to be highly problematic anyway. In the contextual view on meaning the distinction between statements about meaning and statements about the world (and the corresponding analytic-synthetic distinction) is replaced by the distinction between contextually uninformative statements (contextually necessary and impossible ones) and contextually informative statements (contextually contingent ones). One of the reasons of the breakdown of the popular view is that there are no statements about meanings which are not at the same time statements about the world[6]. This may be made clear as follows. In a context a set of worlds say S, is given as (logically) *possible*, and the informative statements made in that context determine which worlds are to be considered as false, although logically possible, i.e. which ones are "contingently false". The real world is one of the remaining ones, which one it is not determined. Suppose now that we have stated, in a given context, a certain theory and that we have restricted in this way the contextually possible worlds by eliminating some of them as "contingently false". Let the set of possible and not contingently false worlds be S'. Now we may pass to another context in which S' is considered as the set of contextually possible worlds. By stating certain sentences to be true we will again, in the new context, eliminate members of S'. If we run into problems (e.g., if we come upon a sentence that we want to consider true for empirical reasons but that is false in all non-eliminated worlds), then we may either remain in the same context (keep S' as the set of possible worlds) and reject part of the theory stated earlier in that context, or we may pass to another context (broaden S' into S'', possibly S) and start over again. In this sense discussions about meanings and discussions about the world are similar to each other. To say 'p means q' instead of 'p if and only if q' comes down then to an odd way to indicate that one shifts to another context (a "higher" one) in which a statement that was contextually irrelevant in the context just left becomes contextually informative.

The reader will remember my claim (in section 2) that talk about possible worlds is not fundamental with respect to meaning. All statements made in this section may indeed be derived from more fundamental statements in terms of meaning elements. It seems to me, however, that the statements made here might have an higher intuitive appeal than statements about meaning elements, mainly because the above statements about possible worlds are akin to the kind of talk that I presume the reader to be familiar with from the literature. In the next section I shall present some hints about the more fundamental formulations in terms of meaning elements. There I shall also present some examples in order to clarify further and to offer arguments in favor of what was said in this section.

6. *Some examples.*

It is generally accepted nowadays that the use of a language implies a theory on the world. According to the contextual view this should be rephrased as : the use of a certain language in a context implies a restriction on the considered set of possible worlds. Take the example of Newtonian mass. In certain contexts the use of the term 'mass' implies that each body has a mass which remains constant as long as the body itself (as long as no parts are removed or added) and which is independent of changes in temperature, pressure, velocity, etc. This implies that worlds in which at least one body has a different mass at different times are not considered as possible. Which worlds are considered and which are not depends on a relation between meaning elements. All sentences ascribing a certain mass to a given body at a given moment correspond to (have as meanings) the members of a family of meaning elements (these elements need not be primitive !). All sentences ascribing a mass to the same body at another given moment correspond to another such family. The use of the term 'mass' in the contexts under consideration introduces a dependency between all such families. With respect to the Boolean algebra (supposing that a PC-language is used) each element of a family becomes identical to an element (the corresponding one) of all other families. Hence all such families reduce to one. The result might seem a bit startling, but is unavoidable and easy explained. *In* the given context there is no difference in meaning between 'at time t m(a) = r' and 'at time t'' m(a) = r'; neither is there a difference in meaning between the preceding sentences and 'm(a) = r' for that matter. Notice, however, that the term 'mass' may also be used in other contexts in which it does not involve the aforementioned restriction. Indeed, we may explain the "meaning" (in the popular sense) of the Newtonian notion of mass to someone who hears the word for the first time, and we may also explain it to someone who grasps already the "meaning" of 'mass at a given moment' but who has yet to be told that mass is conceived as constant.

In general, the use of a language in a certain context results in the elimination of certain meaning elements (in considering them identical with the zero-element). This in turn results in the elimination of certain worlds (in considering them as contextually impossible). However, the involved elimination is not always of the same kind. Let us consider some more examples. In certain contexts the use of names for colours implies a restriction on the possible colours that may occur. This may result in a restriction on the members of a family of (not necessarily elementary) meaning elements, in that some of them are eliminated (identified with the zero element). In some contexts in which constants and variables for objects are used, the primitive meaning elements may become restricted to those that may be further analysed as involving properties of objects and relations between such. In some contexts operational definitions are used. These state relations between the meanings of the defining terms and the meaning of the defined term. Since operational definitions are almost never introduced as genuine conventional definitions, their introduction usually involves severe restrictions on meaning elements and possible worlds. The operational definition(s) of length presuppose(s) that the instruments for measuring lengths are invariable "in length" in the situations they are devised for, that all such instruments correspond to each other "in length" (more correctly, that their "parts" correspond to each other "in length" in overlapping domains), and so on. All these are examples of restrictions on meaning elements and possible worlds.

Up to now we considered only contexts in which the logical connectives were those of PC, i.e. were connectives the "meanings" of which is described by PC. Of course, in some contexts logical connectives with other "meanings" are used. Let us restrict our attention to material propositional logics. By a material logic I mean a logic that may be characterized semantically in such a way that (a) a formula is valid if and only if it is true in all worlds and (b) the truth value of a formula depends only on the semantic characterization of that world and is independent of the semantic characterizations of other worlds. Whether a logic is material or not will not always be easy to find out (the property might even be undecidable); modal logics and relevance logics do not seem to be material, but I did not sufficiently study the matter in order to offer a proof of this. Anyway, to the material logic will correspond an algebra which may be defined on the primitive meaning elements. An operation of this algebra will correspond to each logical connective. This algebra will do the job of the Boolean algebra in section 2. Suppose, e.g., that we consider a logic according to which (p&~p) is not a logical falsehood. Hence, among other things, (p&~p) ≡ (q&~q) will not be valid. According to the corresponding algebra, the meaning of (p&~p), for a given sentence p, will not be identical to the zero element. In terms of possible worlds : "inconsistent" worlds are possible. (An inconsistent world is not one in which a fact both is and is not the case, but one in which two facts are the case, the second of which is algebraicly included in the complement of the former.) Hence, in a context in which we use this logic we shall consider another set of possible worlds as in a context in which we use PC.

It seems interesting to note that the case of contradictions might also be handled differently. Some will indeed hold that the world as such is consistent; i.e. that it is impossible that two facts that belong to the same family are the case. Even then we may make sense of a logic according to which (p&~p) is not logically false (or analogously, according to which it is possible that neither p nor ~p is true. Instead of considering incomplete and inconsistent worlds, we shall then consider only complete and consistent worlds, but allow for "corrupted meaning valuations". E.g', the meaning of some sentence p might be (a+b) and the meaning of q might be (a×—b), whereas we accept, for some or other reason, that ~p and q have the same meaning. This might work out quite smootly on condition that the meaning of the negation is not the aforementioned complement (—) from the Boolean algebra, but is some other kind of complement, say one written as C. Indeed, although (a+b) will not be identical to —(a×—b) if a and b belong to different families, (a+b) might quite well be identical to C(a×—b), or to C(a×Cb). I did not yet sufficiently work out this approach in order to see all its consequences.

According to the approach in which inconsistent and incomplete worlds may be considered, the general notion of a world comes to a set of primitive meaning elements (elementary facts), or, still more in general and in order to take account of many-valued logics, to a set of ordered couples, each couple consisting of (a) a primitive meaning element and (b) a truth value. On the primitive meaning elements an algebra (or a combination of algebras) is defined. In this way we get complex meaning elements, but we do not get any supplementary worlds; an algebraic function is not a supplementary fact. The algebra does, however, lead to a restriction on the set of worlds, for they characterize certain worlds as inconsistent and others as incomplete, and hence as out of consideration. (And remember that the algebras are not only necessary with respect to the used logics; the meaning of an atomic sentence will in general not be a primitive meaning element.)

7. *Conclusion.*

I have tried to describe a semantics that enables one to define the important notions from the theory of meaning, as far as propositional languages are concerned. I have referred to the importance and use of the non-traditional meaning notions, which are specific for this semantics. I have also argued that the basic views behind this semantics should be combined with a contextual view on meaning. I shall now point to some problems for the discussion of which the present approach to meaning is relevant in an obvious way.
(a) The present approach makes it possible to compare in a semantic way the meanings of statements belonging to different languages. It also enables us to formulate the criterion for deciding whether or not a sentence from one language may be translated into another language. This is relevant for the discussion on the commensurability of theories (and notice that the problem is not one of commensurability of theories as such but of commensurability of theories within contexts).
(b) The contextual view is relevant for the determination of the nature of logic and for the problem of logical inference. I have discussed this in my (1975b) and have shown that the contextual view leads to a clear formulation of the problem of inference, to a selection of relevant arguments, and to a very simple solution (which does by no means depend on such confused animals as intuitions).
(c) The approach defended here sheds new light on the analytic-synthetic discussion. It leads to the rejection of this distinction properly, but enables one nevertheless to understand the real factors that lead people to introduce this distinction (see also section 5).
(d) The approach is also relevant with respect to the question whether it is possible to distinguish between "semantic" and "factual" parts of a theory; and it is relevant for the discussion on

wholism and for the discussion on conventionalism ("conventions",in the sense in which the term is used in that discussion, restrict the domain of considered worlds).

I am fully aware of the fact that a lot of problems remain unsolved, both concerning the approach defended here and concerning its relations to fields outside the theory of meaning. Nevertheless, I hope that the present discussion will be sufficient to convince the reader of the possible fruitfulness of the approach and of the necessity to develop it further.

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NOTES

[1] As may be seen from my (1975a) one may actually define two part-whole relations for meanings. The stronger of these relations holds only between p and q if q logically implies p.

[2] As shown in my (1975a) it is preferable to define strict independence in such a way that, for all p, p is strictly independent of logically necessary and logically impossible sentences; whence the relation is reflexive with respect to contingent sentences only.

[3] The literature is not consistent with respect to the definition of 'asymmetric' (I follow the *Encyclopedia of Philosophy* here). What I mean is that (p)P(q) is false if (q)P(p) is true, unless p and q have the same meaning.

[4] The axiomatization of the traditional meaning notions (i.e. of 'logical necessity', in terms of which the other are definable) was performed by Hamblin (1959). His axioms are identical to those of T.

[5] This paper contains numerous misprints and quite a few errors. A corrected version may be obtained from the author.

[6] Of course, plain conventional definitions (as 'a zoozo' $=_{df}$ 'a philosopher who plays the trumpet') are not statements about the world; but they are neither about meaning anyway.

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