

TWO-PHASE EPISTEMOLOGY AND MODELS FOR DIALOGUE LOGIC

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1. The Modified Replacement Theory of Truth; or, two-phase evaluation theory.

The advent of dialogue logic some quarter of a century ago roughly coincided with the coming into age of another approach to logic, the model-theoretic one. Since they were independent movements it might seem as if they were at variance with each other. In any case they were competing interests. In dialogue logic the rules of the game themselves, with the addition of the notion of a winning strategy, were taken to be all the semantics you need. I shall not so much argue against that view as showing another way of looking at things without going beyond the conceptual confines of a philosophy that takes the practical importance of human discussion as its primary focus and construes its concepts on that basis.

Before proceeding to a survey of the basic ideas of a dialogical model theory let us turn to the central notion of pre-dialogical epistemology, viz. to the notion of Truth. I shall recommend a “pragmatization” of semantical theory; this might be thought to imply a recommendation of a pragmatistical theory of truth in James’ or Dewey’s sense, which it does not. In what follows one will find no characterization of what Truth is, or on how to find Truth or distinguish it from Falsity. These two questions concern open places in what I have to say (as is usual in semantics), places that can be filled in in any desired manner.

Let us acknowledge that the discussion about the nature of Truth, though long-winded, has not led us anywhere, and that it has certainly not led us any closer to a theory that can be brought to bear on the question of the solution of conflicts of opinion by verbal means — James, Dewey, or Tarski notwithstanding. To start with,

let us assume a Replacement Theory of Truth. This is the theory that the notions of Truth and Falsity cannot without considerable risk simply be eliminated from our cultural luggage as the defenders of the Redundancy Theory would have it, but that the theoretical emphasis on the true-false distinction should be replaced, at least for the time being, by a theoretical emphasis on a fresh distinction capable of alerting our fantasies as theoreticians and as philosophers and of showing us new directions. Another tract on what "True" and "False" *mean* or on how to ascertain truth is no longer likely to do that.

The specific version of this Replacement Theory of the notion of truth that I take as point of departure here contains a recommendation to shift the focus of theoretical attention from the True/False dichotomy to the dichotomy (not extensionally constant in time) Agreed/Not-agreed. Like "True" and "False", these latter predicates may be thought of as applying to propositions, to statements, or to sentences. The latter distinction can fulfill all those tasks that are fulfilled by the former in consequence of its being a distinction. In addition, agreement or non-agreement is an outcome of a discussion, which the terms of, say, the distinction Attractive/Unattractive are not. Hence Agreed/Not-agreed recommends itself in a natural manner as a component of a model structure for dialogue theory.

I now want to replace the Replacement Theory of the notion of Truth by one that may be called the Modified Replacement Theory, or, better perhaps, the Two-Phase Evaluation Theory. Although in connection with dialogue logic in theory and in practice, a shift of theoretical interest and energy expenditure in the direction of agreement and non-agreement may be recommended, this is not to say that the True/False distinction does not or should not play a considerable role in ordinary practical life, or in the professional life of scientists (including mathematicians). I take it to be an empirical fact, easily verified, that most people do hold a more or less sophisticated "correspondence" theory of Truth, based on a realist metaphysics and or physics of the one and only objective world, which presumably resembles their own subjective "world" in at least some features, though they may not be dogmatic about *which* features.

Strictly speaking the phases to be distinguished below are types of phases in the scientific or philosophical procedure, and after any phase of one type a phase of the other type may follow. Two phases

of different type may overlap chronologically, even if they pertain to the same conflict or problem. Some readers may prefer "activity type" to "phase", but I shall go on using the latter term in order to indicate the need for the recognition of a distinction within the philosophy of science (or epistemology in the wider sense). Logic will be classified as one of the sciences. Partly for the sake of euphony I have chosen to use "epistemology" rather than for instance "research" or "science" in the title of this paper. "Epistemology" should here obviously be taken in its widest sense in which it includes the analysis of the modes of scientific representation.

PHASE I: PREPARATION. This is the socially solipsistic phase in which I am operating alone in the physical (historical, ...) world. That is to say, I am alone with my conception of a physical world, in the objective world (if any), in as much as I am not yet involved in the use of language for communicatory or critical purposes, though I may not be alone in the laboratory. It is in this phase that the (or, a) distinction¹ between Truth and Falsity is of value to me, and it is in this phase, therefore, that I need criteriological definitions, one or more, of Truth (true judgement).

Classical epistemology as a whole, being veridical, pertains in that form exclusively to this phase. Non-veridical constructive (intuitionistic) mathematics as it stands and especially intuitionistic philosophy of mathematics belong in their entirety to this phase.

PHASE II: THE ARENA. The expression is taken from Naess (1937/1956), where it may at first seem to be used somewhat metaphorically, as a quip for the notion of "the scientific forum", but "the scientific arena" brings out better than the latter expression the origins of debate in feuds and the scientific norm that feuds be dealt with by debate. When one has ventured so far — entered the arena — then what counts is to have a winning strategy. It is here that the question of "the goingbeyondableness of Language", which is English for *die Hintergebarkeit der Sprache*² becomes a serious issue; it does not pertain to Phase I. Language is not goingbeyondable in Phase II. In other words, the only logical sentence values here are Agreed and Not-agreed. The only epistemic values in this phase are winning and losing. There are at least two types of logical activity that can be won and lost :

- (1) discussion: Lorenzen's dialogue rules replace the rules of "deductive" logic;
- (2) wager (betting): Hofstee's betting reconstruction of empirical

research is intended to replace descriptions of inductive procedures and their philosophy (Hofstee 1980, 1984)³.

By using ordinals for the two phases (rather than "A" and "B", say) and by ordering the phases this way, I hope to dispel the impression, easily induced by numbering the phases the other way round, that our theory is related to that of Jürgen Habermas, whose philosophy of Truth indicates an interest in the ultimate and which requires a notion of an ideal discussion group (milieu).

My preference for calling the one-role phase Phase I is basically dictated by the condition that it must be possible to extend the description at the Phase II end into the sociology of science and motivational studies and into the history of science as well. That condition stems from the conviction that, as a rule, scientists and philosophers are *in fact* interested in truth almost only as a means to success, as preparing the stage for cognitive or social victory. With a veridical phase as Phase II and the dialogical phase as the preparatory educational Phase I the task of satisfying this condition seems an impossible one. In fact, that way of looking at things is the prevailing view, which has prevented us from linking the history and the sociology of science to non-pragmatical tracts on truth and verisimilitude. It will certainly not do, as some pragmatical sceptics seem to think, to simply neglect that part of the literature. Some of it may be pragmatized⁴ and may then be seen to pertain, after all, to Phase II; some of it may have to go; and some can be classified as it stands as essentially pertaining to the preparatory Phase I.

That one in fact debates in order to arrive at truth strikes me as too unrealistic a hypothesis to deserve further reflection. It can be done and it is noble, but it is uncommon. It is another thing that the outcome of a discussion is, as a matter of fact, fed into Phase I as material for further preparation, for future exchanges of ideas.

2. *Dialectical models for dialogue logic*

Having thus (I hope) expelled the assumption that a pragmatization of semantics implies by necessity the advocacy of a pragmatist theory of truth as well as the idea that the notion of truth has no longer any serious practical function, I proceed to a brief description of dialogical model theory and its embedding. It is a philosophy of situations, based directly on Kripke's (1965), hence indirectly on Beth's (1956). Kripke introduced the notion of an epistemic or *evidential situation* — though with no mention of an

epistemic subject that finds itself in the situation in question. Mention of epistemic role is redundant only when one thinks there are no such roles (the topic is Knowledge, which is being had, and it matters little who has it) or that there is exactly one (the Thinker, the Knowing Subject). So the omission of an epistemic subject, or subjects, forces us to read this semantical theory as pertaining to Phase I.

In 1957 Rupert Crawshay-Williams introduced the notion of a 'company' of users of language. We may speak of a dialogical (or, dialectical) company. Let us retain this notion but let us use instead the following, philosophically more suggestive, expression: *a (the) dialectical subject (in question)*. That is a body of linguistically equipped persons who are consciously concerned with problems of cognitive inference and verbalized argument, about whose solution they may disagree. A statement made by one member of this dialectical subject may be challenged by another or by the same person; if the challenge is accepted — and no earlier — the one who issued the statement becomes the proponent — Lorenzen's term — of the thesis in a debate. Lorenzen's introduction around 1960 of logical roles into the formulation of formalized logic, his relating the rules of the game to such roles, and above all his recognition that there is more than one such role was a crucial step in bringing formal logic into Phase Two.

At the same time the model-theoretic notion of logical validity was pragmatized. The usual model-theoretical definition was replaced by a game-theoretical definition: An argument is valid when the Proponent of the conclusion-thesis "has" a winning strategy however the Opponent argues, provided the latter concedes the premises of the argument and sticks to the rules of the game. (An objectivist notion of existence remains (the Proponent *has* ..."). It is possible to do something about this but it is a question we shall not go further into here.)

Lorenzen has shunned model theory and may have his reasons for that. Is it possible "to do model theory" in an enlightening way concerning Phase-II formal logic? If one wants to do that one must keep in mind that constructive logic, too, can be transposed into dialogical form. In fact Lorenzen has sometimes held that the dialogical set-up most naturally leads to a system of rules equivalent to Heyting's constructive logic. This is now commonly thought not to be the case — the set of rules Lorenzen referred to is not more obviously "right" than some other sets — but in any case the

“constructive” form of dialogue logic must be taken into account when one thinks about the possibilities of an adequate “modelling” of systems of rules for dialogue logic. Kripke has offered an epistemic (“evidential”) model structure for constructive logic. With Kripke’s idea as point of departure Barth and Krabbe (1982) describe the structure of models for the sentential part of dialogue logic as follows:⁵

A structure $\zeta = \langle A, N, D, R \rangle$ is a normal model structure for dialogue logic *iff* A (Agreed) and N (Not-agreed) are “dialectical” values, D a set of dialectical situations, ($D \neq \emptyset$), R a reflexive and transitive relation ($R \subseteq D^2$).

A structure $\zeta = \langle A, N, D, \text{Abs}, R \rangle$ is a minimal model structure for dialogue logic *iff* (as above), and Abs a set of absurd dialectical situations ($\text{Abs} \in D$).

The company/dialectical subject/logical subject γ is in a situation d such that $d \in \text{Abs}$ *iff* γ positively agrees on Λ in d . Λ is a decidedly false sentence (decision taken by γ).

We determine constructive and minimal logics as logics of *growth of agreement* in the sense of logics of growing bodies of sentences upon which positive agreement has been reached in (or, by) the dialectical subject. A cumulative interpretation function is one that everywhere satisfies the norm: if dRd' and $I(U, d) = A$ then $I(U, d') = A$ for all atoms U . A constructive dialectical model for a language L is a couple $\langle \zeta, I \rangle$ where ζ is a normal dialectical structure and I a cumulative interpretation function defined for all pairs $\langle U, d \rangle$ (U is a sentence of L , $d \in D$) and which takes only A and N as values. A minimal dialectical model for a language L^Λ , i.e. for a language containing one or more decidedly false sentences Λ , is a couple $\langle \zeta, I \rangle$ where ζ is a minimal dialectical structure and I a cumulative interpretation function as above. It will be clear that the development relation R in models with a cumulative interpretation function must be transitive, and that we (as theoreticians) may decide that each dialectical situation is to be characterized as a trivial development of itself, i.e. that R is reflexive (by convention).

The required proofs of the adequacy of this model type for constructive logic and for minimal logic, *for instance* in their dialogical form as constructive dialogic and minimal dialogue logic,

are given in our (1982). We showed there that the notions of Truth and Falsity can be understood as generated from the asymmetrical residue R_{cstr}^{as} of some development relation R_{cstr} for a constructive model for dialogue logic, by application of what Beth called Aristotle's Principle of the Absolute. This deeply lying cognitive principle, which pervades the whole of European thought, is the dubious principle or habit of assuming the existence, at least in a theoretical sense, of "the infinitieth" or absolute entity ω_r for any philosophically interesting non-empty asymmetric relation r : The ω in question is the one generated by R_{cstr}^{as} . It is "the" cumulative development of all situations in the field of that relation, the real historical development relation. We may call this "postulated" situation d^* .

We call this postulated dialectical state ontology. Our claim is that this definition is not a prescriptive but rather a descriptive definition that perhaps ought to become the lexical definition. Since this definition reconstructs the genesis of an image that is formed at a semi-conscious level it may be better to speak of an explication, in Carnap's sense. We showed that classical logic can be understood as the logic of that absolute (final, infinitieth) dialectical state d^* , if we define:

$$I_M(U) = T := v_{M^*}(U, d^*) = A$$

$$I_M(U) = F := v_{M^*}(U, d^*) = N$$

Here M^* is a constructive model $\langle \zeta^*, I^* \rangle$ the D of which is or contains as a proper part the postulated d^* . M is the simple triple $\langle T, F, I \rangle$, where I is an atomic-interpretation function that has only one free variable, whereas I^* and all other constructive interpretation functions have two. Now we can identify combination I below with combination II:

I

- the triple $M = \langle T, F, I \rangle$
- the classical semantic rules for sentence evaluation

II

- the quintuple $M^* = \langle A, N, D, R, I^* \rangle$ where $d^* \in D$, d^* defined as above
- the semantical rules for sentence evaluation in a constructive model that is assumed to satisfy Aristotle's Principle of the Absolute

For since by the definition of d^* there is no d' such that d^*Rd' except d^* itself, the semantic rules for constructive general sentence evaluation degenerate in such a manner that d^* may be thought to have dropped out and may be treated accordingly. For instance, the constructive rule for the evaluation of complex sentences with a prenex negation element :

$$v(\neg U, d) = A \text{ iff } (\forall d')(dRd' \supset v(U, d') = N)$$

becomes, if applied to d^* ,

$$v(\neg U, d^*) = A \text{ iff } v(U, d^*) = N$$

and similarly for all the other sentence connectives of formal logic.

A second change in model-theoretic semantics concerns modal logic, where possible-worlds semantics was first to appear. I am referring to the replacement of that type of semantics for modal logic by one in terms of *levels of discourse* (*Dialogebenen*), which is due to M. Marčinko, R. Inhetveen and E.C.W. Krabbe. The notion of levels of discourse was introduced by Marčinko. The most comprehensive discussion of this approach known to me is to be found in Krabbe's doctoral dissertation.⁶

A third, and very general, change which enormously widens the applicability of formal logic is that of eliminating the assumption of cumulation, be it of knowledge or of agreement, from the models for formal logics.⁷ As in our (1982) I would say that this principle is rather well adapted to companies of mathematicians and therefore may be taken to define mathematical logic in the narrower sense, characterizing it as a proper part of formal logic. For all other fields than that of mathematics formal logic(s) will have to be non-cumulative. As a step on the way to a more realistic approach to normative logic pertaining to companies outside the circles of mathematicians the importance of a rigorous elimination of cumulation assumptions cannot be exaggerated. When this is combined with a dialogical model theory as above we may be in the possession of a view and a theory or logic that has a realistic chance of being accepted in practical life.⁸

3. Representational forms

Ontology and truth-valued semantics as academic pursuits clearly

pertain to Phase I. The same can be said for all epistemology commonly so called. Studies of truth and verisimilitude, of corroboration, of objective and subjective probability are concerned with the human orientation and presuppositions in the preparatory Phase I. Knowledge, belief and intentionality are likewise Phase-I features of human organisms, and so investigations into problems of knowledge and belief etc. may be called Phase-I oriented philosophy or research, or Phase-I theory, for short. The same holds for possible-worlds semantics. Our dialectical model theory for dialogue logic clearly belongs, with the logic it models, to the theory class that we have called Phase-II theory.

Let us be a bit more explicit about the representational forms of Phase-I theories and the way in which they differ from the representational forms of Phase-II theory.

Phase-I theory :

(a) A role-free, object-oriented representational form: *Objective description*. The subject terms of the sentences of the theory are names or descriptions of "objects". Verbs are frequently in the passive voice (*be seen, be used, be found, etc.*), often in combination with modalities (*can be seen, can be used, can be found, etc.*), or else they are preceded by the impersonal *it* (*It is possible ..., It is impossible, ...*). Quantifiers are used to refer to a pre-existent domain of objects (*There is...*) and are defined accordingly.

(b) A one-role representational form "with a knowing subject": *Subjective description*. Terms frequently are names or descriptions of mental constructs. Verbs usually occur in the active voice. Quantifiers refer to constructions and constructs or to other activities of the social solipsist.

Phase-II theory :

A role-oriented representational form with a less rich set of less rich domains of objects presumed to be or described as pre-existent. Names or descriptions of objects and constructs are less often grammatical and logical subject terms, and never in combination with passive verbal constructions. Rules are related to roles. Authors and readers take "quantification" to indicate role-dependent rights and duties of investigators or their critics (this is not yet common usage).

4. *Intra-phase and inter-phase pragmatization: Kant transformations and Naess transformations*

Pragmatization is a two-dimensional concept in our culture, pertaining to quite different historical processes. If one starts from a Phase-I theory T_m^I , an *intra-phase pragmatization* of T_m^I may consist in bringing to the fore the beliefs, attitudes, problems or activities of the social solipsist in so far as these are connected with the phenomena to which T_m^I pertains and in so far as no names or descriptions of these are to be found in the basic terminology (lexicon) of T_m^I . They may be brought to the fore by means of additions or other complications of the statements of T_m^I or by systematic replacements of terms in those statements, or both. Such theory transformations may be called *Kant transformations* and can be denoted as follows :

$$(1) T_m^I \xrightarrow{K} T_n^I$$

I shall say that a Kant transformation is *completed* only if the social solipsist is explicitly mentioned in the statements of the resulting theory T_n^I (e.g., as *Myself*), so that all verbs occur in the active voice.

An *inter-phase pragmatization* of T_m^I may consist in bringing to the fore the problems, conflicts, roles, conventions and rules for verbal and other intersubjective behaviour, as well as intersubjective attitudes, of and in the company (the Arena population), in so far as these are connected with the phenomena to which T_m^I pertains, and in so far as no names or descriptions of these are to be found in the basic terminology (lexicon) of T_m^I . As in the case of intra-phase pragmatization these may be brought to the fore by means of additions or other complications of the statements of T_m^I or by systematic replacements of terms in those statements, or both. Such theory transformations may be called *Naess transformations* and can be denoted as follows :

$$(2) T_m^I \xrightarrow{N} T_n^{II}$$

I shall say that a Naess transformation is *completed* only if all relevant social and theoretical roles are explicitly mentioned in the statements of the resulting theory T_n^{II} (e.g., *Proponent* and *Opponent*), so that all verbs are in the active voice.

5. *An hypothesis about human options: Representational duality*

Given a completed Naess transformation (2), the result T_n^{II} may be called a *Phase-II dual* of T_m^I and T_m^I a *Phase-I dual* of T_n^{II} .

Given a logically relevant Phase-I theory T_m^I , can one always create a logically relevant Phase-II dual of that theory? The hypothesis that one can always or very often do this and that the converse is equally possible, may be called *the hypothesis of representational duality*. By "the converse" I mean a kind or kinds of reference-introducing "projection" of the sentences — their lexicon and their syntax — of T_n^{II} onto a "referential screen", an as yet undefined mathematical space. Assuming that such projections are possible and even that they can be carried out in a systematic manner according to more or less algorithmic rules, I shall call them *converse Naess transformations*. Converse Naess transformations are de-pragmatizing theory transformations.

History abounds with examples of Naess transformations and even contains examples of converse Naess transformations, though the nature of the general projection rules are as yet not clear to us. One of the most interesting examples is found in the history of the Calculus, or mathematical analysis. In its initial garb it was called the Infinitesimal Calculus and was a clear case of Phase-I theory. The long development that led up to Weierstrass' formulation of statements involving the concept of limit: "For all ϵ there is a δ such that ...", can now be understood — thanks to Lorenzen's Phase-II definitions of the quantifiers — to amount to a complete Naess transformation. The Weierstrass theory is a Phase-II dual of the infinitesimal calculus. (Notice that I do not speak of *the* Phase-N dual of a given Phase-N' theory but merely of *a* dual.)

This feat of pragmatization was followed (one is inclined to say: was answered) by a successful de-pragmatization, in the sense of a Phase-I dual of the Weierstrass version of the Calculus — Nonstandard Analysis. I do not by this mean to imply anything whatsoever about Abraham Robinson's overt or hidden mental techniques in finding this dual. I merely state that his theory may be classified as a Phase-I dual of what had then become the standard theory.

Another development that embodies the same pattern of pragmatization followed by de-pragmatization is that of the study of generic terms and sentences, in the sense of quantifier-free occurrences of terms, particularly of grammatical subject terms, based on a common noun of *countable* entities (*man, lion, state,*

electric bulb, ...). The interesting cases are these enigmatic cases in which the use in question is not institutional and in which no (mere) reference is intended or involved to genetics in the biological sense (as in the case of *the lion*) or to any known recipe or mode of construction (as in the case of *the electric bulb*). In philosophy and elsewhere in our culture such enigmatic usages of "generic" terms abound. The upshot of my own investigations in this field (I cannot here reproduce the very involved arguments) is, first, that whatever one thinks of such generic terms (or, of such uses of generic terms) from the limited point of view of Phase-I philosophy and semantics, no trace of a Phase-II theory of such generics exists that can justify their present uses in communication from a logical point of view; furthermore, that there is no systematic or historical reason to think that such a theory is in principle feasible; and that, on the contrary, such enigmatic uses of generic terms in common and in philosophical language must be seen as the most serious impediment in ordinary language to the construction of a communicational theory of argumentation.

For, contrary to what the naïve listener (and the naïve theoretician) will be inclined to think, such terms do not have a non-contextual philosophical *suppositio* of their own, but are *abbreviations* of terms that refer to some philosophy or theory that the speaker takes for granted and therefore does not mention. More correctly, the sentences in which these terms occur abbreviate sentences that contain such reference. Thus a statement of a sentence of the form

(1) *(The/a/an) F is G*

satisfying the proviso's mentioned above should be understood as abbreviating a statement of a sentence of the form

(2) *According to philosophy/theory T, every F is really G*

When the speaker firmly believes in one and only one reasonable philosophy T*, he or she will choose the linguistic form (1), and only then. This is the same as saying that in very many cases — namely, whenever the speaker is unwilling to develop T* and subject it to critical discussion — to utter a generic sentence (1) is to utter a dogma and to be aware of it. It follows that (in the terminology of speech-act theory) statement (1) is not "felicitous", or "happy",

if it can be made the object of debate. Or, in the terminology introduced in the present paper, if there is a Phase-I semantic theory of such generic terms and their sentences, then it cannot have a Phase-II dual. It seems to me to follow from this that such a semantic theory cannot be of importance for *logic*, whatever epistemic phase one is interested in when studying and developing logic.

It is characteristic of the dominant fashion in theoretical philosophy at the moment that attempts are made at giving abstract, anti-pragmatic "semantic" underpinnings of "generic sentences" in which no Phase-II phenomena are taken into account. The aspiration seems to be toward a type of theory that will be classified as model-theoretic (the most prestigious type of all at the moment). As the reader will understand, in my opinion such attempts are doomed to failure. Part of the reasons have already been given above. But there is more.

One theory that for centuries — no one today knows for how long — was widely regarded as T* is the former general metaphysical theory of infinitesimals (infinitesimal entities). According to this metaphysics there are infinitesimals corresponding to all kinds of measurable things. They are sheer 'qualities' of great metaphysical power and freed from all traces of 'quantity'. These infinitesimal entities embody (are) the essences or deepest Being of countable ('quantitative') individuals. Owing to the wide ramifications of this belief in sections of culture that one usually thinks of as disjunct — such as medicine, mathematics, pictorial art — it may be better to speak of a *mode of thought* than of a theory or a philosophy. Where this mode of thought prevails, statements about 'pure qualities' will be made by means of sentences of the form (1). Conversely, where this mode of thought prevails the semantics of generic sentences of the form (1) must bring out this former very general metaphysical belief in infinitesimal qualitative entities — any other kind of semantic theory will then simply be false.

There are good reasons for believing that this mode of thought, or a closely related mode, is still fairly common today among parts of the population in the West.⁹ This is an empirical hypothesis, it can be put to the test. Furthermore, even when the said mode of thought is no longer dominating at a conscious level, its remnants may influence deeper cognitive levels and deeper linguistic levels, too. When this mode of thought is entirely a matter of the past, then we shall be left with the *form* (1), without being able to furnish the exemplars of the subject terms of applications of (1) with referential

meaning of any kind, and without being able to furnish them with any sense other than the speech-act function of discretely hinting at a dogmatic position (ones own).

Our culture may have arrived at that stage today, at least in parts. It follows that theories of the meaning of 'generic' terms and sentences concerning Phase I that do not take intellectual history into account are idle theories which have no Phase-II duals.

Let us also classify the theories mentioned earlier in this paper in our schema of the two phases.

Kripke's evidential-situation semantics with sentence values in $\{K, U\}$ (Known, Unknown) is a Phase-I semantics, though not a veridical one. It may be understood as the result of an incomplete Kant transformation of veridical semantics.

Game-theoretical semantics may be seen as another intra-phase pragmatization within Phase-I theory, of veridical semantics. It is *not* the semantics of dialogue logic; it is the Phase-I dual of that logic. It may be understood as another Kant transformation of veridical semantics, with aspirations to completeness.

The philosophical fashion in the United States dictates that one restricts ones activities to the study of the problems of Phase I, to the extent that the existence of a Phase II is denied (by implication) or relegated to "Pragmatics", the not so respectable brother of Semantics — and similarly for other branches of philosophy. Part of the explanation for this is found in the old rationalist philosophy of mathematics according to which mathematics, the proof of ones being created in God's image, was taken — wrongly, I think — to be rooted only in the no-role or one-role Phase I. No-role philosophy of mathematics includes realism and formalism. Intuitionism is a one-role philosophy of mathematics.

The standpoint that a mathematical proof is a proof only after it has been *accepted as* a proof, launched some years ago by Yu. Manin (1979),¹⁰ is equivalent to the thesis that in the logic and epistemology of mathematics, too, there is a Phase II of exactly as great importance as Phase I, exactly as essential to the nature of mathematics as Phase I. That outlook is entirely foreign to *all* philosophies of mathematics that have been competing for recognition ...

Excepting for the philosophy of mathematics one may say that analytic philosophy in Scandinavia (Naess and others) and on the European continent (Beth, Lorenzen, and others) has been vastly more attuned to the importance of Phase II than American philo-

sophers have been. Some of them (Naess, Lorenzen) did their main work about Phase II. At this moment, such work has little or no chance of being absorbed into American philosophy and its associated schools. The restriction to Phase-I philosophy in the United States and elsewhere is quite wrongly identified as a professionalization of philosophy, and vice versa. I think this restriction has other roots in addition, one of them being a philosophical outlook — the outlook that social solipsism is the alpha and omega of *logic*, if of nothing else. About this I have severe doubts, and I hope to have instilled the beginnings of a similar doubt in the reader.

6. *Idle and non-idle Phase-I theories. Preparation*

We may not need every theory in Phase-I oriented philosophy (and science). There are four possibilities which I shall call (i)—(iv).

(i) A certain theory in Phase-I philosophy may turn out, as a consequence of a philosophical paradigm shift in the direction of a more pragmatical general philosophy, to be a mere exercise (in ontology, semantics or whatever), an idle “realist” or conceptualist structure with no realistic bearing. But the class of such theories may also be empty. I am not particularly interested in this class and mention it only for the sake of completeness.

(ii) A theory in Phase-I philosophy may be subjected to pragmatization and *then* be seen to be of intrinsic value, whereas in its former garb it is rather pointless. I suspect that this class will turn out to be (to become regarded as) non-empty, but this is not either the point I want to make here.

(iii) A theory in Phase-I philosophy may have an important Phase-II dual and nevertheless be of preparatory value, as explained above.

(iv) There may be non-idle theories in Phase-I philosophy that have no Phase-II dual, though I very much doubt that this is the case.

On my estimate Phase-II theories cannot, in the long run, be missed without serious socio-cultural danger. Unfortunately there are not too many of them.

The most interesting case is, in my opinion, case (iii). The question of the practical value of the notions True and False is a case in point. Some philosophers (Ramsey, Ayer) have defended the position that these notions do not have any serious practical value at all. They do have clear Phase-II duals: Agreed, Not-agreed (i.e. positively agreed,

not positively agreed). I believe that they nevertheless have a considerable practical value of their own, and that this value is a preparatory one, hence that some theorizing about Truth and Falsity may be philosophically enlightening. The same may be said for constructionist and (other) conceptualist theories — there may be some that remain enlightening in a worth-while manner about Phase I even when they have Phase-II duals.

If the notions of Truth and Falsity, veridical epistemology, and veridical semantics have a serious practical value, then why is that so?¹¹ If we relegate all this to Phase I which is said to be the preparatory phase, then the question becomes how to explain that Truth and Falsity as guiding notions can be of preparatory value, i.e. instruments by which we educate ourselves for the Arena. An answer which can only be very partial but which in any case is free from circularity is that the two sets of values, {T, F} and {A, N}, have the same number of elements, so that the one can function as an image of the other and Truth-oriented activities (and theories) can function as images of Agreement-oriented ones, to the extent that there is structural similarity. But how far does this structural identity go? Here is where game-theoretical semantics comes in. It is the most epistemic semantics around, provided we see epistemics as knowledge acquisition and knowledge acquisition as a Phase-I activity. The roles that Hintikka introduces are Myself and Nature. He sometimes connects his presentations of this semantical philosophy with the later Wittgenstein, but sometimes also, and then more convincingly, with Kantian philosophy. This desire to fit in with both Wittgenstein and Kant is only confusing and in fact prevents us from seeing what the philosophical interest of game-theoretical semantics is. He cannot have it both ways, it seems. It nicely reflects a Kantian interest. Allusions to the later Wittgenstein are appropriate in connection with dialogue logic, which is a Phase-II theory. The two, game-theoretical semantics and dialogue logic, mirror each other beautifully. If we define a true sentence as one for which 'I Myself' have a winning strategy in material or formal debate against 'Nature', then we have a truth-valued (or, as Krabbe would say, a material) semantics that neatly mirrors agreement-valued dialogue logic.

For this very reason game-theoretical semantics should be welcomed as precisely what Hintikka says it is — a semantical theory. It is a not-idle Phase-I semantic theory that has a Phase-II dual, dialogue logic, which has a Phase-II semantics of its own. It is concerned with the preparatory stage of seeking and finding, a

preparation we absolutely cannot do without, however much we yearn for victory in the Arena. It is *possible* to explain the value of seeking and finding as preparatory activities even on the hypothesis that there is no common objective world, precisely by reference to the structural identity. (If everyone involved does believe in such a common world, then there is no philosophical problem.)

In a book that is now in press I have split up the notion of linguistic competence into a *pair* of linguistic-competence notions, that of the Producer and that of the Interpreter. (These two semantic roles may be and often are enacted by one and the same person at the same time, and this is the reason that I prefer the said expressions to "Speaker" and "Hearer".) Montague's theory of sentence meaning, for instance, and most such theories that are constructed by logicians, I take to be theories of the Interpreter's representational apparatus, with no bearing on the Producer's representational apparatus. I am inclined to see game-theoretical semantics as irrelevant to interpretational interests and needs and as belonging with the Producer, as a contribution to "supply-side", hence (one might say) to Phase-I semantics. (If one is allowed to speculate, I would either say that there cannot be such a thing as Phase-II supply-side semantics, or, equivalently, that Phase-I and Phase-II supply-side semantics are identical.)

This latter link between game-theoretical semantics and the Producer in a theory with *semantical* roles will have to be further explored before one can say whether the suggestion is a sound one or not. Clearly all theories about the Interpreter's competence (interpretational competence) and the Interpreter's representational apparatus must be listed as Phase-II theory. To integrate supply-side as well as demand-side semantical theories with the dialectical models for dialogue logic described in Section 2 in a comprehensive theory regarding the two phases is a task for the future.

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NOTES

¹ It may be a good idea to stop looking for definitions of Truth, and to start constructing solipsistic definitions of the Truth/Falsity *distinction*, for use in studies of Phase I activity. At least this seems to be the best procedure for whoever is not ready to admit that his

or her notion of Truth is generated in the manner to be described in Section 2. The definition of the Truth-Falsity distinction should be such that this distinction does not by definition coincide with every other epistemic distinction (such as that between agreement and non-agreement).

²This expression is common in German philosophy of science and in discussions of hermeneutics. See for instance K. Lorenz and J. Mittelstrass (1967), 'Die Hintergebarkeit der Sprache'. I hope these two distinguished authors will forgive me for making a linguistic joke issuing from the title of their paper.

³Giles has offered a betting approach to formal "deductive" logic which may be said to mediate between (1) and (2). Cf. R. Giles (1974), (1976).

⁴In my paper (1985) — in press —, pragmatizations of the kind I have in mind here are called "Naess transformations".

⁵Cf. E. M. Barth and E. C. W. Krabbe (1982), Part Three.

⁶Krabbe (1982b), Ch. 11.

⁷In 1978 Woods and Walton, closely followed by Mackenzie in 1979, exploited the idea of non-cumulative logic in the study of certain fallacies, notably in connection with circularity and question-begging. For history and for reference to related theories see Note 10 to Ch. 10 of Krabbe (1982b). Shortly afterwards (1983) U. Blau solves the paradox of the Hangman by rejecting what he calls "the axiom of knowledge conservation".

⁸E.C.W. Krabbe took up this suggestion and worked it out in Ch. 10 of his (1982b).

⁹There may even be something 'natural' about it, for all we know. For instance, logical ontogenesis may well be a repetition of the logical phylogenesis — who can say. However, my argument does not hinge on this possibility.

¹⁰Yu. Manin (1977), (1979).

¹¹In addition to the Phase-I value that the notions of Truth and Falsity have for the social solipsist in preparing him or her for the Arena, they also may have a practical value of another kind, a Phase-II value. They may have an *ethical value* in the sense that involves the value of co-operation with other beings. It seems to me that assumptions of objective Truth and Falsity should be analysed in the light of the Prisoner's Dilemma and the necessity of participating

in series of such games against the same adversaries. It will not do to just go on talking "ontology" and "corroboration".

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