Some Comments
on the Linkage of Syntax

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Some general acknowledgement is due Arthur Eddington whose work has been the source of key unifying ideas that underlie the course.

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Contents

Some sort of apology for the rough and repetitious character of these notes is called for. They are an attempt to get at some metaphysical implications of emerging brain models, a field which is in a state of most rapid flux. They are also an attempt to enlist your help in developing and bringing this material into a better more accessible form.

The course may be usefully viewed as a contribution towards building a formal theoretical foundation for the practice of our Afro-American traditions, which are the heart core and realization of the American culture.

INTRODUCTION

Computer-oriented self-models are emerging out of present-day research which view all life as a game, whose moves are the mutually exclusive behavioral elements, and whose goal function is the search for self-repeating paths in the exponentially opening tree of possible moves.

Causal self-models have peculiarities in their logical status, when applied to the organization of the decision process, which are not as relevant for other types of causal models, and which need explicit treatment. In addition, new self-models carry with them a new metaphysics, a new way to pass from syntax to subjectivity, and a correspondingly new classification scheme. Although all such "newness" turns out to be merely an integration of the competitive variety of old views, so in a sense to contain nothing new, at all, yet, to achieve this requires a variety of new technical tricks, or causal insights, which give a sharpness and sweep to old ideas that they did not have before.

The introduction will concern itself with a broad informal over-all view of the classification schemes that underlie these new developments, with a few hints to indicate the logical position of the self-models or nervous system model to follow.

1. WHAT IS THOUGHT?

What is thought? This very ancient question is coming up again pressingly in such modern contexts as that of computer design, which strangely enough seem to be forcing us back into some very ancient answers. Any "answer" to this question is apt to be more of a challenge than an answer, for any "answer" raises a cascade of new questions to be met, under which most "answers" tend to evaporate, or split up into a pile of interesting comments. One modern answer, however, though far from adequate, has, nevertheless, achieved a certain stable working persistence because of its association with a wide range of especially practical and fruitful research. It is the view that thought is verbal behavior, of a type responding to itself. (See e.g. B.F. Skinner, Verbal Behavior.)

(Now such a view is often regarded as self-evidently absurd. "Does a parrot understand Newton's laws because he can recite F=MA?" Of course not. "Then understanding must be more than verbal." No, this does not follow. For suppose one could feed this parrot any of a wide class of problems involving Newton's laws, and he could apply them correctly and reach right answers most of the time, could one not then say he knew Newton's laws? Many issues remain, but this is enough to help point out that the verbal view of thought is not necessarily absurd. Understanding

is associated not with the isolated verbal response but with a class of responses.)

This answer is a very ancient one. Thomas Aquinas makes the point very forcefully in insisting that thought is discoursive, not intuitive, and John's Gospel opens with this recognition.

As an "answer" however it poses terrible difficulties, in part because it has latent in it such a shockingly concrete and committed position, whereas, easier answers let us escape into the ambiguity of endless classifications. The actual application of verbalization to "life" involves us in "denotation," in the jump to "objectivity" and the naming of "things." As one mathematician has said, (See A. Heyting, Intuitionism), if we examine the way of talking of idealists, and apply to it modern semantic criticism to force them to define terms, they all seem to end up talking, in effect, as if the world was made up of nothing but words. (Spengler accuses Kierkegaard of reducing religion to word music.) To live in the world we seem, in practice, to have to treat it as made of a lot more types of categories, such as "things," too. If the idealists are to make of their position more than a pious wish, they are going to have to show how other types of categories can be translated into this common type. The burden of proof is clearly on the idealist, since common practice of daily decision making seems not now cast in these forms, and how to do so is far from obvious.

One great source of encouragement in this direction is that another community of discourse, the scientific one, which, like the religious one, has become increasingly alienated from the categories of daily decision making, seems to be forced into this "idealistic" position shared by religion, but from other, very different motives, from its concern for a consistent theory to organize wide ranges of practical research, and the paralyzing ambiguities if not contradictions into which these non-verbal answers about thought lead in hard scientific practice.

Thus, religion seems to be finding an ally in what once seemed her worst opponent. Could it be, perhaps, that in joining forces on this issue, they could together break into the citadel of practical decision making and bring or translate its forms into verbal categories?

Now practical life, like science and religion, is concerned with problem solving. But what is a problem? How can we so define the concept "problem" as to bring out a common element, via which to relate its many varieties? This can seem quite impossible when one is faced with the overwhelmingly rich variety of techniques of problem formulation in such divergent fields. Roughly the position we are going to take is that all problems are conflicts about what to say, which have underlying style or person independent counterparts as conflicts over how to act. Problems are thus, ultimately, concerned with resolving conflicts over the

ordering of acts and words, and only indirectly via these concerned with the ordering of things. This notion of a problem is, so to speak, the opening wedge via which we are going to try to bring together the verbally orienting tendencies of religion and modern science, in an assault on the stronghold of daily living. The rest of the course will be concerned with trying to implement this very inadequately defined program, and meet the challenge head on by showing how the world can in practice be usefully viewed as "made up of words."

2. THE METHOD

Now the pieces or ideas we are going to use to try to implement this program are all old ideas, well known, with long histories. What we are going to try to show is that when these many existing ideas are interlinked in a common syntax, they reveal far more than anyone had guessed. They reveal, in fact, a symbolically complete working causal view of the world and man, relative to the issues of our age, a symbolic completeness that it was hard to suspect might be here latent, when the pieces were scattered off in isolated syntaxes.

Thus, the form and content of the course will be a general theory of how to link syntax, and an attempt to carry this out in enough basic situations to illustrate how it can be done, and so make contact with the main body of literature in the different

fields. The need now is not so much for new brilliant insights, but rather for the drudgework of linking up in a common syntax the vast wealth of such insight that has accumulated. For insight to take hold it must become part of a system.

Most of what will be presented first will be merely a framework of categories for classification. Such frameworks are not right or wrong, only useful or not useful. To become right or wrong they must be so compounded with one another as to allow of the isolation of a causal or predictive correlate in their terms, in the universal there is no collision, only in the particular. Until categories are compounded to yield predictions, they are all "right" in the sense of potentially useful. In this sense all philosophies are valuable, and the only task is to expose in a common model the inter-relation of the rich variety of their classification schemes.

Given a classification scheme, even one adequate and appropriate for a causal treatment of issues, it can be a very long hard struggle to find the variety of needed ingenious tricks to bring it into contact with the facts. It takes a long time and a lot of struggle with a new scientific approach, or even well defined theory, before people can tell whether or not it can be made, by a variety of tricks, to meet even the old facts, and yield useful new openings. Philosophers have a tendency to expect their classification, schemes to meet the facts in easy self-

evident ways, or else they feel they are inadequate. But this expectation of itself forces us into sterile, ambiguous and inadequate schemes in the modern context. It may take years and years of struggle by groups of trained experts before the adequacy of even existing well-defined schemes to explain well-known effects, is established (e.g., superconductivity). How long it is before the child's space sense reaches an adequate implementation as a framework to guide the solution of elementary problems in locomotion, such as "going around."

So, too, it will take a lot of elaboration before the categories of abstract verbal ordering, mutual exclusion, decision, etc., which we are going to introduce here, make contact with significant practical predictions and the subjective content of denotation.

In building up the needed models we will go in stages, from the general to the concrete, making our models or themes more concrete or specific each time we "repeat" them. This does not follow the "natural" or historical order, which starts in the middle and becomes in stages both more general and more concrete at once as it builds up greater complexity. The first road in is a crooked one. Once charted, the succession general to particular (which is not the same as simple to complex) is useful in communicating adjustments to others, as it bypasses by a sort of trick (imitation) the many stages of unlearning and relearning by

which the framework was built up. No one should suppose that anyone thinks this way, however.

The cycles of retreatment of our basic theme (that the world is made of words), will take the form of a gradual elaboration of a translation procedure, a set of tricks for defining the subjective categories and concepts that ground the many separate realms of discourse, back into somewhat generalized syntactic categories. We will try and push the procedure to the point of making contact with the major existing realms of discourse (math, physics, psychology, religion, politics, aesthetics, morals), try to develop methods of making contact with each of these realms in turn. The chief tool in organizing these more specific translation procedures will be a functional model of the NS (nervous system). This introductory section will be concerned with discussing the nature and status of the classification schemes that underlie this NS model, which will in turn be used to organize the translation procedures needed to interrelate the various fields.

In the development of the scheme, we will, of course, be constantly involved in incorporating results from present day research (such as the relation of denotation to meaning, etc.), which remain controversial. The purpose of this study is to provide a framework for linking syntax. In doing so the answers to many of these controversies becomes evident. In any case, it

seemed a useless distraction from the main purpose of this study to be constantly explaining in what sense, or even emphasizing that, many of the results taken over from the various fields are still controversial. We present a scheme with these results in them, and hope that the scheme may contribute to their further justification. The basic content is the scheme, and we will present the contacts with experiment, and existing theory, mainly in an attempt to clarify its meaning, and only secondarily to try to justify or prove the scheme as such. If it motivates efforts to further its proof or disproof, and provides an adequate definition so that specialists in the various fields can go ahead and remove its many inevitable errors and ambiguities and elaborate consequences, it will have served its purpose. As it is written by a person who is at best a bad amateur in the so many fields related, all that can be done is to beg for indulgence, and let the great need that something be done in this area, plead for the many obvious inadequacies and errors of the presentation.

3. **WHY LINK SYNTAX?**

Why link syntax at all, and why, once we've done so, should we expect to end up in a verbal orientation?

The need or motivation to link syntax derives directly from the value problem. Religion can be viewed as the causality of conduct (Spengler). Values are concerned with the ordering in the

emissions of our behaviors and words. The value problem is concerned with the partial prediction of this ordering. Most aspects of this ordering no one cares about (as no one cares about the exact positions of all the molecules in the air about us). The aspects of the ordering of our acts of concern are only those in conflict, and the value problem relates to their prediction or reconciliation.

Now isolated bodies of syntax, the isolated fields, are grounded in denotation. That a denotative grounding roots all concepts fully or adequately understood is an isolate of modern semantic criticism of deepest significance. What is not defined directly in terms of denotations can always be regarded as an incomplete form whose "meaning" is derived from the way in which it combines with other symbols to establish a denotation.

Now "values," in practice, are concerned with the way in which the sensuous aspects, or to us known or felt content, of, (or associated with), these learned denotations, compound with one another to effect the ordering of our acts. The value problem is concerned with the way knowledge (as felt) effects behavior.

Conflicts in predicting the ordering of behavior are thus apparently concerned with conflicts about how the content of the denotations combines with one another to define response.

Now it is a major result of the theory of operation of the nervous system to be developed later, that we perceive or feel things only in and as they effect the ordering of emission of our behaviors. This is a key experimental insight of a type which serve to link Augustine's insights as to the mathematical nature of the felt world when seen as part of God, to the modern scientific tradition. Thus, the felt content of denotations (insofar as it exists at all) is fixed for us in terms of abstract "mathematical" categories which are defined via the ways in which they combine with one another to effect emission.

Consequently every conflict regarding the predicted ordering of emission of behavior has its counterpart as a conflict over the felt denotative content of knowledge whose compounding enters into the shaping of a given ordering. All this is, of course, far from obvious. The rest of the course will be involved in justifying it, but it is helpful to introduce it here as an assumption, to help us understand the motivation that underlies the linking of syntax, and the potential depth of its significance to be brought out later.

Thus the value problem forces the exposition of the way in which the various types of denotation combine to effect a common ordering of emissions, and in so doing it forces up the explicit tracing out to a common syntax.

But the point is even deeper than this. The felt content of the denotations, as knowledge, is adequate to root isolated bodies of syntax, or question and answer procedures (QA). But in conflict, when we have to link syntax or isolated QA, these denotations become inadequate, and we need a more primitive base from within which to represent the process of reformation of the content of denotation itself. This more primitive common base turns out to be the verbal order itself. This turns out to be the other side of the coin, as it were, of the earlier assumption that we perceive things only in and as they effect verbal and motor ordering. It is this fact that allows of and justifies the passage to this more primitive base, which it is the purpose of this study to develop.

We end up in a verbal orientation when we link syntax, (in part) because no felt denotative content is invariant enough, or absolute enough to support the value problem, which (as it turns out) always has its counterpart in ambiguous or conflicting denotations. These errors in denotation, as we will see, always come in complementary sets, whose inconsistencies motivate the investigations that force up the missing range of denotation which in turn resolves the conflict. (There is oneness of will only in the truth, as Kierkegaard says, a deeply orienting discovery.) The depth of the issues involved in linking syntax, is well illustrated by the following "Wigner cycle." If you ask a

mathematician what mathematics is "about," most will answer "sets." What is a set? Well, sets are sets of things he will tell you, and if you want to know what they are you must ask a physicist. What, to a physicist is a thing? It is a pattern that measurements come in, most will say. And what is a measurement? Well, that is a subjective category that sends us to psychologists, who in turn when asked send us back around the cycle to mathematicians and physicists. Why have fields been developed on such unsatisfactory isolated bases? One reason is that it was the only way possible. Certain isolated bodies of QA could be systematized. As soon as the isolation was broken down, the "system" collapsed, and schizophrenia ensued. (An often-remarked characteristic of schizophrenia is this tendency to link syntaxes that "normals" are wise enough to keep well separated.)

What then is the nature of this common element, via which such cycles may (we hope to show) be broken? The word "word" is itself very ambiguous, and the attempt to ground on it smells of self-contradiction and patent absurdity.

4. THE WORD

First, what is a word? Clearly by "word" we do not mean these marks on paper, or anything heard or felt. To so define it would involve us in a return to the very sort of denotative

grounding for which the word was to serve as a yet more primitive base. What then is the word?

The word, in the sense in which we are using it, is the carrier of a position in an abstract linear ordering. It has as its basic properties its identifiability, mutual exclusion (related to the fact that we can't say red and water at once) and its relation of before and after to other words. The word, in this sense, is not subjective. However (as the rest of the course will be concerned in showing), certain specialized and complex aspects of its general inter-relatedness can be used as a basis for compounding or representing the subjective via representing the way in which the subjective enters into the generation of the conditional correlations manifest in the verbal order, more especially in QA.

Position in abstract linear ordering provides us with one type of orienting structure. It must be remembered that such position can be indirectly specified in very flexible mathematical ways. To specify does not mean that one can calculate in practice, (few even elementary chemical constants can be calculated from the laws of physics). The recognition of the enormous flexibility and richness of modern techniques of indirectly implied construction should be kept in mind. It makes the possibility of the needed specification of position in abstract linear ordering less absurd.

Denotative conventions are ambiguous, but under one form of interpretation of them, they seem to project certain aspects of the verbal structure on the environment. The classic example of this is the doctrine of things in space.

Can structure be assigned to the environment? Say we see three apples on the table, is not this "threeness" something "assigned," something "out there?" The phrases are, of course, ambiguous. A grounding of syntax involves (minimally) a link to subjectivity. A link to something totally unfelt is irrelevant, or no grounding at all. Now it is apparent that nothing "felt" is "out there." When we speak of something "out there" we refer to something not felt, which exists for us as certain person or attitude independent aspects of what is felt. It is apparent that no grounding in subjectivity succeeds in projecting structure.

But, it might nevertheless be said, some implied but unfelt structure might be thereby projected. Such unfelt projection imputes a structure defined not merely independent of present attitude, but independent of any attitude at all. (Relativity in defining structure in a way independent of (choice of) frame, does not thereby throw the frame out altogether.) This puts projected structure in what could be called an absolute status.

If such a projection is justified, then its consequences should follow, for a projection without consequences is no

projection, (mere noise and mannerism). A most elementary form of such projection is the thing concept. The world, it is supposed, is made up of things in space. (Other projections, such as properties, are usually attached to things, and so involved in their fate.) But even so mild and limited a projection rapidly breaks down in the context of modern quantum physics. The facts of the world cannot be thus viewed. Qualifications and limitations have to be put on the projection. But these qualifications and limitations when clarified constitute an undoing of the projection. They constitute what is called "operationaldefinition," which is a tying back to ourselves, and ultimately to the abstract linear ordering.

It is such considerations as these that have led Carnap and others to develop the thesis that all structure is verbal.

But if this is the case, what is the status of sensation? Surely the visual field exhibits structural aspects. What does it mean to say that these must be ultimately treated as "verbal." Is this not nonsense? The answer is that we treat such distinctions via the way in which they compound with one another to effect the verbal ordering. Insofar as the visual field manifests structure (and it does) it is treated as aspects of the structure of factors compounding the operators that generate the verbal order or QA correlations. The structure is thus never made absolute by projection, but rather is treated as something enacted by us,

involving the will from the very start. Feeling, as the generator of the abstract verbal ordering is also that which individuates the positions in this ordering, that which makes "different," what (as words) were else all the same. The character of feelings are thus not defined in themselves but in relation to their making different which is the other or individuating side of their common or linking function.

To say that we define sensation in relation to its word linking function is at this level of generality, of course, to satisfy no one. We must show how this can be done. The only purpose of the argument is to leave an open (minded) framework, or classification scheme for future filling.

If we examine the felt denotative grounding, we will find that it has the same common sensuous character for all fields. There is no mysterious gap between feelings for "sets," and feelings for "measurements," or feelings of "touch," which could justify the isolation of syntax. The felt groundings are not isolated, but in a common pool. It is not the felt grounding, but the functional position of words in relation to other words, that separates fields. This common character of the felt grounding is, in its way. the most powerful source of a need for some more primitive base than denotation. It is at once an argument for the non-primitive nature of the felt content of denotation, and for the relatability of the various types of denotation, since they

are all rooted in a common material. (The mathematician in thinking about abstract sets, the musician in thinking about sound, the theologian in thinking about God, all use reorderings of the same material. There is no evidence of such isolation in the content thought about as might support (let alone justify) the isolation of their respective syntaxes. Such isolation, as itself an erroneous implied assumption, allows us to derive anything we please. In abstracting the same material in several ways, while pretending to abstract several different materials, it is little wonder that pandemonium ensues. It takes but one accepted contradiction, to "derive" anything at all. In "value" terms this process is even made respectable. In the mouth of a "powerful" man error becomes paradox and paradox wisdom. It is little wonder that modern semantics with its endless separating types and levels has proven so useless in the political realm, worse than useless, paralyzing. But our acts, thank goodness, are wiser than our logic or words.) What does it mean in more positive terms to orient the "felt" via the way it links words? It means that the basic organic unit of cohesion is not treated as (thing relating) space, but rather as (word relating) decision. Sensation is thus treated as an abstraction not from objects in space, but from an ordered sequence of "decision-like" moments of felt time. The sense of a present space traveling along in time, has long been recognized as absurd. The subjective

character of any felt difference involves factors spread over one-tenth or so of a second in time, at least. For many reasons (as we shall see) the interpretation of felt "space" difference (no feelings having meaning for us in themselves) involves both space and time in the physics sense. Thus the metaphysics of the old space notion, and its associated projections fall apart at its root.

Hopefully, the above discussion has set in temporary abeyance some of the more pressing "self-evident" objections to the notion and status of "word" as here developed, and prepared the mind with rough elements of a classification scheme and hinted expectations, to be filled in by things to come.

We have now to examine the consequences of a verbal grounding for the practical classification or orientation of meanings.

5. MEANING

"Meaning" in a verbal orientation of structure takes the form of verbal correlation. A verbal correlation is ultimately a causal abstraction from the verbal order, and as such an element of will and subjectively "possessive." This bypasses the need for denotative "justification," an "existence" equivalent being implicit in the fact that we do so act or will. As a grounding more primitive than denotation, these correlations (C) derive

their justification not from belief but from their causal status (which in certain contexts, carries with it what we mean by belief, that we do so act.) The simple verbal correlation (VC) as thus defined is, of course, an unfelt component of the will, but special elaborate compoundings of it will be felt. (Similarly, the basic concepts of quantum theory have no simple correspondence in observation, but special elaborate compoundings of them do.) The link to subjectivity as to measurement is no longer made at the level of "simples." The simplest felt distinction (or measurement) is already enormously complex.

Concepts, or the felt content of denotations are thus treated as incomplete C's, whose ultimate meaning lies in the way they combine to define C's. It is not the concept, but verbal practice that grounds. Felt denotational aspects serve as a sort of half-way house to simplify the reference to complex C, just as constructed concepts in mathematics serve as half-way houses to the basic definitions which it would be quite absurd, as well as impossible, to keep referring to directly in practice.

The actual causal C's are thus specified in what might be called nested stages, indirectly via the multiple conditions denotatively isolated that they satisfy and which generate them.

Rich orienting analogies which suggest this type of relation can be found within both physics and mathematics proper. There is

the earlier discussed relation of physics to chemistry, where the generating conditions or principles can be defined, though the actual calculation is too difficult to make. The multiple independent nature of these conditions, indirectly gotten at, generate and qualify the observed causal C's of chemistry, even though the gap cannot be closed explicitly.

The arithmetization of the geometries (largely accomplished by Descartes) is a prototype that suggests the process of representation of formerly felt primitive concepts (here lines and planes, etc.) by complex verbal orderings (sets and sets of sets of numbers, etc.).

Now this notion of a verbal C, which is at the foundation of meaning, is also at the foundation of the laws of brain operation, as the conditioned reflex (CR) principle. This principle is not so much a "machine" in the usual sense, as an open functional form into which any machines can fit. It is the mechanical counterpart of this minimal element of meaning. Thomas Aquinas was a Pavlovian in his outlook, in that he said that habit goes to the very definition of man. Thus, the notion of verbal C at the root of meaning has very simple parallels in the basic unit of brain operation. The relation of these two concepts remain complex matters, but the logical similarity between the CR and verbal C’s, as elementary universals, makes it possible that an orientation of experience in relation to verbal C may be an

especially fruitful platform from within which to trace from subjective to physiological categories.

We are now in a position to hint at one of the basic laws of brain operation. Consider, -- how is it that these indirect methods of specification of verbal C's have counterparts in our subjective sense of "meaning?" How is such a thing possible at all? Roughly speaking to emerge as a stable C implies properties of repetition, or invariance. But a stability condition will be seen on careful examination, to already smell of the subjective character of meaning and will. Now causal correlations are also invariant correlations (natural law being unchanging) and this link turns out to be at the hub of the relation between felt meaning, the laws of NS operation, mathematical specification, and various religious insights.

The needed tricky abstraction processes to get at universals reflecting all the verbal ordering, and in a form appropriate for herding or redefining into the common synthesizing models of physics, are hard to find.

One must remember that one can catch various aspects of the abstract verbal ordering one at a time in many indirect ways. All that concerns us (and so all that needs to be made explicit) are the parts related to conflict. With the tentative hint of the use of the CR principle, and some form of stability and invariance to

organize these C's,—we can perhaps clear our expectations of the sense of obvious absurdity of the role the NS model is to serve, and prepare them for something of its form, something of its logical position in the representation of felt meaning via verbal C.

6. WHITEHEAD - SCHOPENHAUER ORDERINGS

One is free, after all, to "order" any which way. The same place can be called "two up and three over" or "three over and two up." So, too, we can order the surface of the ocean spacially, or in terms of the curvature indexes at each point (Eddington), etc., etc. How one orders is a function of the task in hand. A spacial ordering has often been advantageous for the problem of systematizing the class of QA associated with physics, though even within physics other orderings are often resorted to. Space ordering dominates in practice the systematization of logic, or the panorama of denotations. Another type of ordering is the easiest from within which to trace the link to subjective access, however. This course will he concerned with procedures for translating between them for which the above example (unscrambling an ordering of the ocean surface by curvature indexes and finding the corresponding space indexes) provides a suggestive prototype.

Whitehead developed a view or ordering of the world as made up, not of things in space, but of ingressing universals (whose patterns or conditions of ingress were to be traced often using spacial frames), a correlated verbal ordering is simply a more concrete form of this general Whiteheadian type of ordering, which is so especially relevant in organizing subjective access. A verbal correlation, as abstracted, has the status of an ingressing universal, and so suggests the form of a common basis within which to generate a complex variety which will allow of the analysis or representation of the latent conceptual content of these ingressing forms, which Whitehead treats as not further analyzable.

Now such felt ingressing universals, viewed as concepts defined in terms of their effect on motor ordering, means their treatment as will. That the subjective is experienced as will is a recognition of Schopenhauer's which the verbal C orientation combines with that of Whitehead.

The basic status of the verbal C orderings is summarized in the recognition that time is deeper or more primitive than space, space existing for us only as an implicit useful category in systematizing the individual patterns of time ordering.

The potential ingress of wide classes of sensuosity (and concept insofar as felt is in no separate "non-sensuous " world)

are organized via denotation in a space-time frame. The denotations pin down the unfolding draperies of possibility, here and there, enough to guide routine decision.

The sensuous groupings that cluster about the denotation are often taken in attitude and person independent sets, when this is done the denotation is sometimes regarded as pointing to non-subjective categories, "the thing out there," etc. Now, of course, what is not subjective is irrelevant for us. What is relevant is not something non-subjective but the large cluster of person or attitude independent sensuosity that is indirectly and more briefly summarized via the denotation. Frequently the simplest, easiest point of sensuous contact is with verbal practice regarded as a sensuous object. Most words are about words. Such a grounding must not be confused with the one where the words are abstracted as unfelt will elements.

Whether or not one regards denotation as involving non-subjective "things" is really irrelevant, a matter of taste, since what is "not felt" depends for its meaning on its being an incomplete symbol involved in specifying that felt. The thing denoted seems to function in some philosophic contexts like the fifth leg on a dog. ("What barks like a dog, wags its tail like a dog,-- etc., but has five legs?" "I don't know." "A dog." "But --- !" "Oh, the fifth leg? That was just thrown in to make the problem hard.") No one ever saw it or felt it. It is just there

to make trouble by giving rise to absurdity when felt facts won't hang on it (as when its old forms were put to use in draping the sensuosity organized in quantum formulas).

Now the sensuous patterning as hung in space-time has, as a pattern, no simple or relevant relation to the subjectivity as felt. The classificatory phrases used to describe these patterns could be called the first linearization. Somewhere latent in them is, of course, an implicit representation of feeling (as the laws of physics hide implicit in grocery lists, or any facts, somehow). But basically the patterning provides no simple correspondence for tracing the role of sensuosity in generating ordering.

What could be called the second linearization is concerned with the way in which the subjective content tied down via the first linearization, combines in brains to shape the ordering of emission. It is important to note that although the specific felt content of denotation can be provided an adequate second linearization relative to any given problem or issue, this second linearization can never be made absolute (or it would amount to successful projection of structure). Operational definitions (and behaviorism) are a sort of half-way house to the second linearization, which ignore, however, the problem of representing subjectivity and leave us with most of the old metaphysical issues merely shifted into a new form or style, ("What is an

operation or a behavior?" instead of "'What is a thing?"). It is important to note that the denotative grounding is overwhelmingly adequate in practice (most remarkably and unexpectedly). When scientific theories collide the trouble is not that the parties fail to agree on what a "denotated fact" is. (A few experimental re-checks quickly clear up momentary divergences as to facts, showing that the nature of the abstract notion "denoted facts" is not in issue in practice, however much it may plague philosophy.) Scientific theories collide only when they predict different facts.

Now despite this overwhelming practical adequacy, the concept of denotation cannot be, itself, linearized. To do so would represent projection of structure, qualifying in an a priorie way the local character of self and world. (The transcendental religious restrictions are only global ones and cannot be projected.) They cannot be turned into explicit restrictions on the laws of physics as some have tried. Many attempts have been made to linearize the general notion denotation, as via defining it operationally. (Of course this can always be done for specific problems). Although metaphysically attractive as it would provide such a cheap bypass of so many issues, it always fails in practice. It is always easy to show situations where the given rule fails to include wide classes of essential denotative content, and one is driven back on the

vastly simpler and yet far more powerful informal groundings of the notion of denotation. Denotation (like matter) is a transcendental isolate that ever becomes linearized in new ways in the context of new issues, and especially in the context of new self models.

Whiteheadian ordering is, as we will see when we develop the NS model, especially appropriate for tracing a second linearization type of link. It forms the key for analyzing (rather than merely treating as unprobable simples as Whitehead does) the theoretic content of the felt ingressing universals themselves——having, as a verbal structure, these same ingressing universal properties. It serves as a basis for classifying "mathematically" or representing feeling, whereas space-time is merely used to systematize their entry. These techniques used to systematize the representation of feeling will (as we shall see) quite incidentally, involve a discussion of the NS encoding of behavior, too.

Conflict as conflict on how to behave, always has its aspect as denotative ambiguity. Treated in Whiteheadian space, as a conflict of felt universals (and associated heuristics) that underlie the specific acts it becomes amenable to resolution. A heuristic has itself (as we will see) its origin as something implicit in internalized past history, more especially something implicit in the causal C's there isolated. Conflict as among them

thus sends us back to quite specific ranges of history, or the field of possibles, to test out or clarify. The investigation of the facts underlying the heuristics implicit in the felt are a sort of second blind or investigatory return to probe the field of possibles from whose internalization the maxim was derived. Thus Whiteheadian space acts as a sort of intermediary guiding the investigation process, with the isolation of adequate qualifications or U's one reconciles the underlying feelings, correcting, thereby, the space-time ordering, and related sense of plan. The space-time ordering is thus a foreshortened systematization of the "blind" probings (in which we don't know ahead what will happen), probings which are in a sense forced on us by the failure of this space-time ordering. The foreshortened forms are the operative, "doing" ones. This probing is a kind of directed or localized return to childhood as the maxim competition forces the opening up (enacting) of their component sub-maxims to a causal level to find a reconciling qualification. It leads to a changed word ordering, a discovery of the resolving word hidden off in the field of possibles.

This translation procedure can be regarded as between the unfelt implied carriers of the denotations (abstract point "things" such as field strengths) which happen to be in X, and the abstract words (also unfelt) of the linear ordering. The

status of this translation procedure is a matter of deepest significance.

Physics models use sets of ordered points in what one might call a potentially denotable status. As such they form the ground of what we will call deduction space. The verbal ordering, on the other hand, is a set of mutually excluding points or entities, the pattern of whose correlations defines what we can call induction space (for reason to be discussed later).

In the past these orderings have been regarded as complementary, or in any case distinct (with "perhaps" the latter contained in the former).

In our present outlook, however, each set is complete and all inclusive. Everything in the world can be viewed as made up of either set.

A very similar situation emerged in the development of physics proper. Thus in the old physics (as correspondingly in old self-models) position was regarded as independent of momentum (velocity times mass), a particle being assignable arbitrary independent probability distribution in position and momentum coordinates. In the new physics, however, these are found to be complex functions of one another, and elaborate translation procedures are developed for passing from what is called position space to momentum space (and back). A point in position space is

thus made a complex function of the probability distribution in momentum space (and inversely). Each represents all the facts alone.

Of course the translation procedures involved in passing from deduction to induction space (as above defined) are of a very different logical nature. The passage either way causes changes in the space translated into, and the two spaces are never in reconciliation. (The particular can never be reconciled with the universal.) A well established contradiction in deduction space always gives rise to the discovery of a new class of points (words) in induction space. Such a contradiction is only established via universals of the will (without which they could not be seen) and it leads to their reformation as new heuristics (new theories or word sets), and feelings. In reverse contradictions in the universal if solid, lead to a change of particulars, that is, changes in deduction space which change takes the double form of new tasks and new implied point sets. Such changes resolve the X's among U's, for these can only go via the particular.

Now it could be objected that there are just not enough word points for such a mapping to be valid. The implied space points are infinite, how can they ever be mapped into mere words?

An answer to that is that the exponentially opening tree of possible words has a lot of words. This infinity of implied points in deduction space is itself a creation of the word. The infinite is after all but a convenience to simplify the information processing. What it "means" is at best that you can always do one better if you want to.

The mathematics of the issue is easy, the problem is to feel what it means. In the inductive ordering the world is treated as one grand computer, and the spectral set of universal operators generating the total tree of possible word orderings stand for the world, for all that is, not for some small interior aspect of the brain.

Indeed in this view the exponentially opening word tree is far "too large." Only a small part of it is used in the mapping from deduction to induction space, the part "believed." In this sense the world (as Kierkegaard says) is discovered in the self, as a sub-aspect of the self, defined by the category repetition. The pumping action of the cycle of X's is all one way, a letting in of new U's in one phase which attack and reorder or further order the particular in the next.

Such powerful analogies as the above from within mathematics and physics proper are available to guide and orient by analogy every step of the more concrete side of self model building which

relates math and physics outside themselves to subjective categories. This appears to hide in itself a weak but useful source of transcendental guidance. New self models may not be expected to emerge until with the "failure" of the old, a new investigation phase has driven up a rich class of tantalizing analogies within the sciences proper that ambiguously invite "absurd" applications to man himself.

Now the "felt," as these ingressing universals, and will at once, has the logical form of an abstract condition defining the self-repeating or correlated paths. But if the ordering is generated by "universals" how can there be any place for development? How can a natural place for change be introduced into such a seemingly static scheme?

7. CHANGE

The logical position of the status of change in the present classification scheme is peculiar. Most of what some might call "change" is treated as mere repetition or randomness, and no change at all. The ordering of motor emissions is viewed as a reflection of the set of ingressing universals which compound to define the self-repeating paths latent (but also hidden) in the chaos. The wide variety of repertoire is but a reflection of the wide variety of compounding universals and the statistical element, both in their compounding, and in the resultant

definition of act. It does not take many independent factors to compound an astronomical repertoire.

All this variety is regarded, in the present outlook, as static. Change is oriented as the intrusion of new universals, new patterns or order out of the chaos. Repetition of old patterns in semi-dice-like sense, is not regarded as change. (In the space view all change is taken up under the category motion which thus gathers or confounds together both significant and insignificant aspects).

Now the ingressing universals serve to systematize, and generate, the self-repeating or correlated paths. Insofar as there is ignorance, the emissions are unregulated, the universals unknown, and there is a corresponding randomness that keeps us out of the hidden correlated paths as the combination lock keeps us out of a safe. It is the relation of "knowledge" to the effectiveness of the universals in taking hold of or shaping emission orderings that leaves or constitutes a place for change.

Now where the ingressing universals (U's) have not been reconciled in practice they lead to contradiction (X), in the sense of competitive (and hence inconsistent) predictions of the order of emission of our behavior in some context. Life has such a rich variety of possibilities that any lack of reconciliation

can always be drawn out into an X somewhere, as more leisure emerges to open the field of possibles.

Whiteheadian or induction space (and the brain, too) is thus like doppler radar that automatically cancels out any echo from an unmoving object, revealing only what moves. This revelation is made via the X, which (as de facto center of attention) automatically focuses attention on the point of change. (If it is not significant it is quickly solved away. What holds the center of attention, the lasting X, is always significant).

The application of Whiteheadian orderings for organizing the translation from and to subjective access is centered on this natural correspondence between the center of attention, and the isolated U's in X. The automatic filtering action of the brain, letting us ignore the old and focus on the new (we don't hear the blood in our ears) has here a simple and deeply significant parallel.

This sense of contradiction is very closely related to the mutually excluding property of the basic elements. It is this property which creates the possibility of X. It is a very specialized and powerful property, like the repulsion between electrons, which (as we shall see) represents a key guiding insight into the core of brain operation, with numerous

experimental counterparts on the level of the hardware of the brain.

It is this sense of X that (in combination with the "statistics" or ambiguity that makes room for it) is the generator of change in a Whiteheadian ordering (corresponding roughly to our sense of motion in a Euclidian ordering).

Change can be viewed as the process by which new conditions take hold of or become incorporated into the ordering of emission of our behavior and words. These new conditions have subjective counterparts as the felt U's generating the repeating paths. Bits of these U's are constantly pushing in and are positively blocked by our sense of contradiction, by our inability to reconcile them with one another in the ordering of the given emission. The felt U's constitute a transcendental ingressing set which are all potentially reconcilable, (since aspects of a common goal function), but to find the avenue for doing so is a long struggle. One piece will appear in one person or moment, another in another, and the alternation thus generated between or within people, constitutes the search process via which the reconciling ordering is found.

Thus, for example, the child may think of his ball as "to the left," because he last felt it there. Later he feels it as "to the right". This creates a confusion read out under existing

conventions as contradiction (how can a ball be a "to the left" ball and a "to the right" ball at once?) until he incorporates the qualifying variables that lets him organize relative motion in space.

As the universals compete for emission the individual charts the limits of the conditions under which each dominates, by enacting and seeing what happens, seeing which U does in fact define the repeating paths of the different contexts. In charting the region of X, which represents the ambiguous edges or extreme limits of the U's, one ends up incorporating qualifying variables that reconcile them subjectively, and the point in X passes elsewhere, letting in, that is letting co-exist, other U's. This reconciliation occurs as soon as the qualifications thus integrated push to the unqualified point. This is a non-trivial and deeply significant isolate, because subjectively the associated competitive sensations are independent and there is no a priori reason why any subjective reconciliation should occur when the unqualified level is reached. It occurs only because when unqualified the forms are discovered to be in fact heuristics of a common goal function – else it would not occur. Thomas recognizes this point in saying that only unqualified universals can be connected. (But they can! The eternal miracle).

The brain can be viewed as a computer for predicting the order of emission of our acts, subjectivity serving to confine

this ordering to repeating paths. Subjective factors are all abstracts from the decision process, the objective components being the person independent factors in the compound.

Logic is inherently tautological, so that it gives rise to nothing new. Its function is to systematize the elaborations of the old, insofar as the old is reconciled. The patterns it elaborates are space oriented. What is reconciled can be projected.

Removal of the X involves not deduction, but induction, the ingress of new feelings as the form of linking up of the competitive old. (The relation to the unknown on the other side of the X struggling to come in is experienced subjectively as the God relation). The sense of space indexes or systematizes the conditions of ingress of these U's, insofar as they have been reconciled, and so become known. One's sense of nature is a sort of great corral in which the generating universals are housed. (No two people paint the same picture of the same view.) induction enlarges the menagerie.

The same feelings can be ordered or read out in a wide variety of ways. They can be read out as statements of the past history that gave rise to them (memory), or statements of the theoretical symmetries of the world that made them possible (intellect), or statements of future decisions or policies

implicit in them (will). The CR, similarly, has this triple aspect. A habit bespeaks its origin, the symmetries there hidden, and future behavior. Thus the CR hides the trinity in embryo (Father and memory, Son and understanding, Holy Ghost and Will,--Augustine). This defines another "magic" parallel which will be powerfully exploited in building the NS model. (All successful causal models are especially adjusted to take advantage of such "magic" parallels — e.g., that between equilibrium and uniform probability in phase space which broke open as statistical mechanics).

The form or place of the X ranges over these three phases, or hides in these three aspects at once, emphasizing first one, then another. Reconciliation of the X involves the adjustment of all three types of symbolic aspects, at once so to speak, the felt universals involving all three spheres at once.

The relation of the word to the inner or concept or theoretic aspects of the universals as felt is best handled in a Whiteheadian frame. This might better be called induction space as it is concerned with induction, or resolving the X. The elaboration of the pattern of the ingressing universals is, however, best handled in a projected Euclidian space orientation. This is a matter of deduction, and its corresponding space might better be called deduction space. Deduction, in a sense, gives rise to nothing new. It symbolizes or represents a semi-

subconscious aspect of brain function. For it, subjectivity represents something definite and given, a class of simples gone back to that provide an adequate base. But although denotation provides a useful and potentially complete base for systematizing routine decisions, no one can or does think in these terms, and hence it does not form an adequate life grounding. It only grounds what is "subconscious" and indirectly implied. We "feel" the subjective not in its status as object denoted but only in its status as generator of decisions, that is, only in its theoretic status as a factor forming part of the conflict at the center of attention.

The decision process cannot be rationally organized in a denotative grounding, thereby bypassing the problem of the theoretic content, of the felt, treating the felt as unreduced simple. The reasons for this can be variously stated. The problem is to find out how we do think, not how we should or might think, and we do not in fact think that way. We are drawn into this way of talking by our analysis of our way of talking. It is very useful (as is the infinite) in simplifying and systematizing the information processing. But it leaves no place for the incoming new. It ignores all that is "now" subjective and now felt as relevant, for it is not in its potential status as object of denotation, but only in its status as living power generating the verbal order, that the felt is now felt. In short it is science,

as that denotatively grounded (not God) which is precisely dead, (and the wished for death which is life). The great nets of science in sweeping the ocean of subjectivity to try and catch a grounding in life, are drawn in upon themselves by their own laws to reveal precisely nothing. Only God is.

The induction process (by contrast to the close conflict avoidance of deduction) views subjectivity itself (as well as its patterns) to be changeable and open, and in itself ambiguous. (The change it isolates in this subjectivity itself is, however, of a very special type, better called differentiation.) It treats it as concept to be clarified. Lacking such a "base" in "simples" it is faced with the problem of what guide to use in probing or molding the felt, how far to differentiate. It finds this guidance (in the absence of simples) through the concept of X. One opens out the field of possibles far enough to remove the X— and so build up a field of possibles big enough to satisfy both conditions at once. One does this precisely by doing what is in conflict, and seeing what happens. Induction is thus conflict oriented, it pushes the crisis, whereas deduction is conflict avoiding, it hangs in the elaboration of the old.

Another important difference between the two spaces lies in their treatment of interactions. In the one case they are treated as going via forces that thereby change and reorganize the common identical things. (The word force is often replaced by other

words when the interaction is treated as going via modified geometries, "exclusion," etc. (the latter term having at best a poetic analogy with verbal exclusion.) In the other case the interaction is treated as going via competitive exclusion between what are ultimately unchanging eternal "things," each such "thing" being individual and different. This seeming paradox of interaction between things that cannot change is "explained" by reading out the exclusion as X, and interpreting reorganization as clarification, etc.

It might be objected that such constancy is an illusion, since it is imposed by the very special way in which we go about abstracting the subjectivity. There are (so the argument would go) endless ways of so abstracting subjectivity as to exhibit change, indeed almost all ways do except a very special artificial one.

The same objection holds with respect to conservation laws in Physics. There are endless ways in which we might assign to things numbers that are objective or person independent. When we have to so stand on our heads, and go through specialized rituals to get "conserved" numbers, are we not creating what we find? Are not conservation laws one big farce? Clearly they are not, because even though their imposition involves a very special struggle, the fact that you can do so at all is deeply significant. The number-assigning procedures are logically

independent of some of the correlations systematized by conservation laws.

So, too, the very specialized abstraction procedures for exhibiting universals are independent of the later discovery that they do not change. The key procedures make use of the relation between the sensuosity and the verbal behavior it generates (occurs in conjunction with). We find that same feelings generate same words, and that they are simple functions of one and another. Thus if we use as the abstracting correlate "functionally" chosen elements of will, we can isolate correlations from corresponding abstractions (what this, this, and this, have in common) that expose unchanging subjective counterparts, whereas if we use "things," then that abstracted can and does change, of course.

Actually these two functions of deduction and induction are complementary, (not opposed), for insofar as elaboration can resolve a conflict, there is no excuse (or will) for an induction effort, induction is premature. (The "choice" between forcing and avoidance of crisis is not choice at all, merely an indirect reflection of the stage of development of one’s insights, and hence not an "opposition.") The space elaboration of the old, however, extends the range of potential conflicts forcing induction.

One must hang in the old forms of space elaboration until the inductions they force are resolved, and a new set of space elaborations (system) generated that resolves. No one can leave the old till the new exists. But even more important, it is not the general abstract contradictions that bring in the new, however important they may be in suggesting guiding ideals and motivating search. It is the detailed inner technical inadequacies of the old in its own terms, the latent self-X within it, that push the new. (The metaphysics of the "thing" concept grounding physics was long known to be absurd by competent philosophers, but it was not until it became technically inadequate for organizing even the facts of physics that one could generate the type of the contradictions that defined adequate technical working substitutes that in fact and practice displaced old views.)

We have tried to suggest something of the centrality of contradiction as the generator of change in a Whiteheadian ordering. In this very inadequate and half-poetic way of suggesting the classification and place of future developments, we have been relying upon the fact that we are speaking to human calculators about themselves, letting them make use of the analogies drawn from their own inner workings to suggest places and inter-relations whose link to more precise verbalization we will discuss later. Once we know the theoretic character of

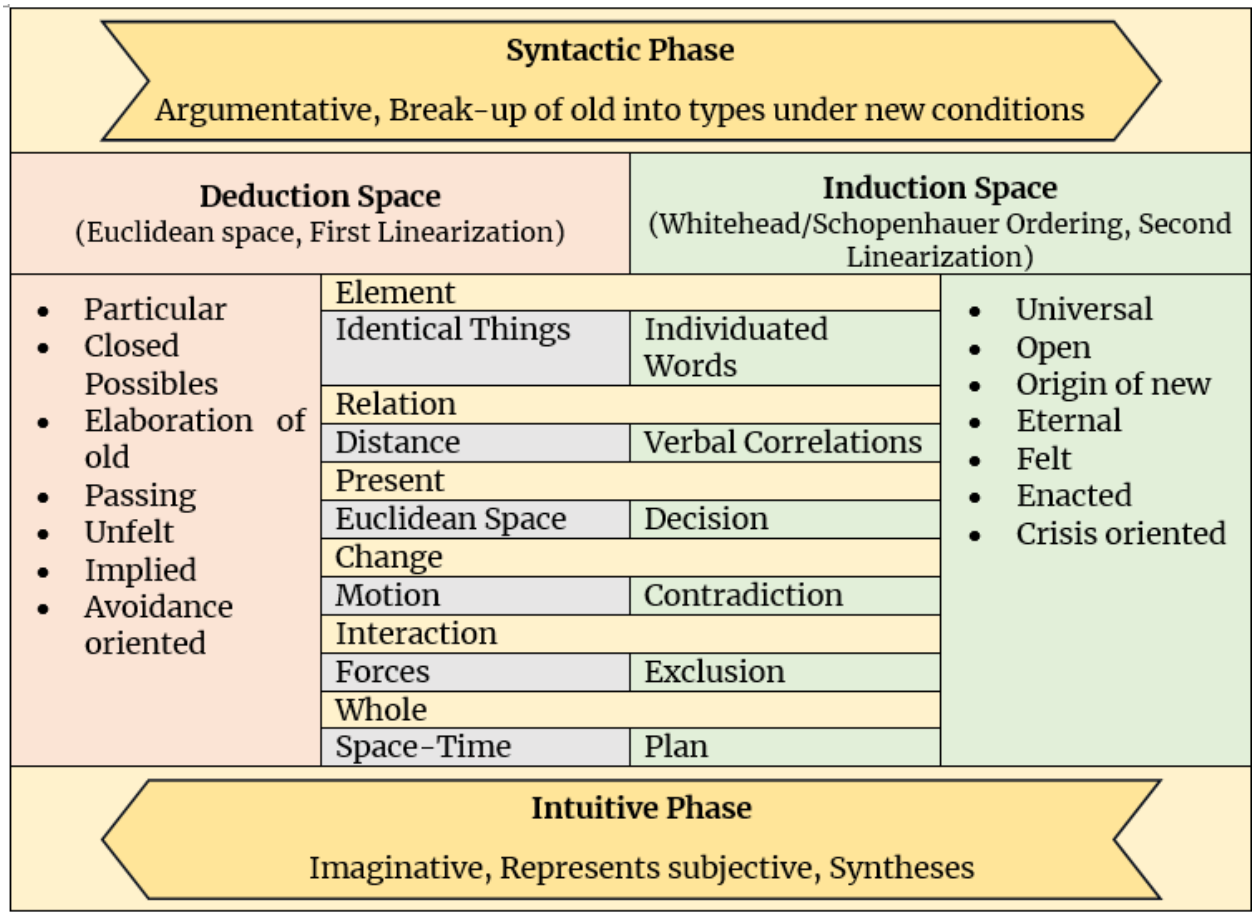
certain subjective factors, we can rely on them to carry out corresponding calculations for us, as the physicist relies on the test tube to carry out quadratures no calculator yet can. It is in this way that theory liberates the inner world, once it identifies the character of its components.

Ultimately the X, as source of change, will become linked to concepts of self-X and social-X, so that the process of resolution will become linked to self model building and to plan. The concept of "plan" plays in the induction space something of the role of space-time in the deduction space, being different views of the same whole.

If we concern ourselves not with the unfelt and indirectly implied order of physics, but with the sensuously felt order (the key to unraveling the confusion that scholastic vocabulary gives rise to in the modern context), then induction is creation, it is the concretely isolated form of the channel of the numen.

Fig. I. The Relation of Induction to Deduction Space

Figure one tries to present schematically the relation of the unfelt deduction space, implicit in our manner of talking, which forms the subconscious mechanical background or underpinning of awareness, to the felt induction space, where the origin of the new is found.



The basic element most convenient in systematizing the patterns of deduction is roughly symbolized by the thing, whereas that most relevant to induction is the word. The corresponding relations might be regarded as distance versus verbal correlation. The sense of the present abstracted from is in the

one case treated as a Euclidian space, in the other, decision. Change is in the one case treated as motion, in the other felt as contradiction. Interaction is treated as force in the one case, and exclusion in the other. The whole is organized procedurally as space-time in the one (unfelt) view, whereas in the other the decisional components organize as (unfelt) plan. As plan the two views merge. In history (as Tolstoy says) the realms of causation and freedom mix and their relation can be explicitly exposed.

Deduction space as the systematization of stable verbal practice, is concerned with the elaboration of the old. It implies a treatment of the field of possibles as closed, and over-defined as particular. It is avoidance oriented, representing the de facto blind mechanical elaboration of the old for as long as we can get away with it.

Induction space is by contrast concerned with the origin of the new, which, as it turns out, is felt. Its sense of space is open, being oriented by the contradiction rather than a set of basic simples. It is enacted, rather than implied, treated as eternal or universal rather than particular and passing. It is crisis oriented, pushing to a conclusion what can no longer be avoided.

Deductive aspects are opened in argumentative or syntactic phases, with no feeling beneath them. They represent the break-up

of old forms into conflicting types, which elaborate against one another while trying to avoid the crisis. It leads into the intuitive phase where this crisis can no longer be avoided.

The intuitive phase is concerned with representing feelings, and so is "conscious," opening new aspects of the self. In an important sense consciousness cannot be static and exists (as we will see) only in creativity. The latent or social contradiction becomes conscious as self-contradiction, which forms the preamble to synthesis. With synthesis we create a new adequate deductive scheme that leads to further (unconscious) elaboration.

Of course, both phases exist at once, both aspects adhering to every ordering. In a sense, however, only the inductive intuitive phase exists (only God exists) as the deductive phase (world) is only indirectly implied in our way of talking. The arrow "really" only goes one way, the way of ingressing universals, enlarging our space sense. The return arrow represents merely the proliferation of types and occasions that leisure and elaboration imply or make possible, nothing positive in the lone individual sense.

In addition the implied space projections of deductive space are constantly being reformed, whereas the felt universal of induction space remain unchanged, merely link up and open.

The induction space dynamics is organized by the goal function, under categories of active control, (whereas the deduction space is passively and predictively organized). In both, the process of definition into causal models removes redundancy. But deduction space makes no subjective link, whereas in induction space this definition process allows us to define in the subjective as word linking operators,- defined always relative to the contradiction (and hence not denotatively rootable). This represents the removal of a vast logical redundancy, as the subjective is usually treated as independent and irreducible (e.g. by B. Russel).

That the forms of the felt should be forms of reason, is a reflection of various things. It depends upon the fact that a stability condition, in the institutional sense, is the very form of reason, as felt. It involves Murphy's Law (what can go wrong, will), that is the tendency of any latent incompleteness to generate positive errors till it is corrected. It also involves the convention of reading into the character of feeling, (else ambiguous), the qualifying variables that specify how it enters into stability conditions, that is its long-range fate via which it becomes clarified.

That the forms of denotation should not be "felt", is a reflection of the fact that we experience or know things only relative to the contradiction, and in the act, not in their

essence, (as Thomas says). We are, in an important sense, not selfconscious.

Induction space exposes the dynamics of defining or "finding" the problem. After that we can get away with the simplification of talking as if we are in deduction space.

8. RELIGION AND CAUSALITY

Religion has been called the "causality of conduct," (Spengler). It tells us properties of the dominant forms of behavior – it tells us things about long range social interactions, it tells us things about the dynamics of memory. Basically, it can be viewed as concerned with the status of the X, the way in which it evolves along its path towards reconciliation, and properties of the reconciliation. Religious insight provides a guiding perspective on the interrelation of social, self, and natural forces at a long view level, which is the so-called absolute, or mathematical or causal level. It helps isolate the control variables that define lasting, or institutional, change, as opposed to changes that merely induce their opposites. It isolates these control-variables in a causal self-model building process implicit in brain function. Self-models differentiated to the causal point, have group resonance effects that generate social change.

Religion, viewed as a causal model of the self, has something of the relation to the horde of life details that the models of statistical mechanics have to the detailed motion of atoms. Religion isolates long range properties of "equilibrium" conditions in CR interactions, in terms which are independent of the specific nature of the interaction. The statistical character of the combining factors greatly simplifies the problem, because it insures that only configurations with certain types of invariance properties will ever emerge or be stable, other factors quickly being washed out.

Morality is concerned not with how we should think, but how we do think. Knowing how we do think, we think better.

Now there is a kind of instinctive fear of such a causal view of religious categories, even though the causal vocabulary may smell so much like the religious vocabulary. There is the vague feeling that a causal explanation in some sense potentially debunks man, or detracts from the larger significance of the human struggle.

But the status of causal law in the modern context has radically changed. It was once thought that the laws of matter were something to be discovered once and for all. The best evidence seems to be that this is impossible. Matter itself shows every sign of being a transcendental category. That is to say,

every time we cut through to a new layer of structure, the new causal insights give rise to an ability to isolate a whole new class of self-repeating paths in the chaos, a whole new technology. Then, by means of this technology, a new layer of structure is revealed that no one had suspected.

But the point is deeper than technological. The technological revolution has not merely its social counterpart, it has also a psychological counterpart in a transformed, or rather differentiated, concept of the self.

The causal penetration of the nature of man does not, therefore, represent a dead end (the subconscious fear) but a transcendentally opening road. God's will which ingresses everywhere and is everywhere one is closely related to the corresponding properties of physics laws, it is this property that links local and global, and which underlies (but is, of course, not the same as) the recognition that what totally reconciles one’s own private experience, will hold for others, too.

The form of causal law, rather than contradict the brilliant scholastic extrapolations of their personal experience, seems to confirm them at every point.

But (it might be objected) if we can build a causal model of man, then we can in effect "black box" him, as we would a radio

tube, represent him by a formula and so bypass the very need of him.

This type of objection can take a wide variety of forms. The key to breaking these tongue-twisters provides us, at the same time, with a certain bird's eye view into the core of the laws of brain operation.

The brain can be viewed as a computer for predicting the order of emission of its own behaviors. The center of attention, the point of emotional involvement, has its counterpart as inconsistent predictions of this order, and consequently as causally incorrect self-model insight.

Thus (as we will see later) what is emotionally significant to the healthy adult is a function of the inadequacies of the cultural self-model insights. This being the case, one can never black-box them until after they are solved, and hence black boxing is not a threat in the old sense.

But, it might be objected, if "we come to understand man, as we understand a typewriter, surely.....!"

Perhaps analogy might be useful here. Savages are at times very impressed by typewriters. Once they understand them, the magic awe goes, but has this debunked the poem written on the typewriter? Quite the opposite—by destroying the merely magical

awe of the poem as thing, it focuses awe on that aspect which is indeed worthy of it, the light of God that shines through it.

Similarly the body as apart from its environment is as "meaningless" as the typewriter without the poet. (A man goes mad in a few hours if cut off from the structured feedbacks that interaction with his environment provides.) The environment here symbolizes God, the source of the very specialized latent harmonies set up within us. Man, as apart from these latent harmonies hidden in matter and society, man as body, is no object of worship but a mere machine like a typewriter. This recognition of modern science is a most ancient and Biblical one, it confirms, rather than threatening, religious models. The discovery of the mechanical emptiness and meaninglessness of man as apart from God is a needed debunking of man that Religion effected long ago, and that science is only rediscovering.

The world can be viewed as a great computer, with its more digital (yes or no) aspects concentrated in the brain, the environment serving to provide analogue (continuously varying) inputs on command. Life is thereby oriented, (as the opening of John’s Gospel implies), in information processing (IP) terms, in relation to a core self-model building process. There is a crucial coupling between social-X and self-X (related in part to the phenomena of imitation) which allows a central view of the whole life phenomena in its terms.

The life symmetry properties that have been isolated in religious tradition, can be easily and convincingly or satisfyingly related to aspects or properties of this over-all view. We will go over a list of them as the course goes by. The impact of modern science appears to be one of overwhelmingly renewing faith, both in its intellectual and emotional side.

9. LIFE AS A GAME, AND EXCLUSION

Life can be brought under the general theory of games. The mutually excluding possible acts represent the moves. These define an exponentially opening tree of possibilities within which the goal function is defined as the search for the self-repeating paths.

The will, in its transcendental form, may be viewed as this search for repeating paths, hidden in the chaos. As thus defined the will turns out to be, at the same time, a transcendental formulation of causal law, i.e., via the tendency of self-repeating C to emerge from the chaos. Such a property is a most unusual one. If we consider the field of mathematical possibilities, it will be apparent that "most" "order" latent in a "chaos" would exhibit no such properties.

The emergent C's, when considered in conjunction with their conditions of stability, can be usefully viewed as "maxims," predictive of the self-repeating character of the path

characteristics to which they contribute. Such a maxim may be regarded, in game terms, as a heuristic. In games, even those as simple as chess, the goal function cannot be tested out directly, as the tree to be investigated is just too astronomically large. Instead, we must use heuristics (such as "avoid double pawns and pins," etc.) which are correlated to the goal function (the more pins, the more likely one is to have his king captured). Now the set of heuristics often come into conflict with one another, but as they are all merely aspects of a common goal function, these conflicts can all be reconciled (at least potentially) by the inclusion of qualifying variable appropriate to the given conflict situations.

The subjectively felt universals, as abstractions from decisions, have all this same aspect, that of being heuristics contributing to the definition of a common goal function, the search for the self-repeating path. It is (in part) for this reason that they are all potentially reconcilable via love. It is a deep and heartening confirmation of this general thesis that the professed long range political aim of the two major social forces of the day, which at once unite and divide mankind, Marxism and Christianity, is precisely the same. All Christians as all Marxists must believe in communism as an article of faith (and both are finding it much harder to reach than expected).

They differ only in the tactics they regard essential to achieving it.

The property of mutual exclusion which is at the root of this possibility of treating life within the framework of the general theory of games is a very deep one of metaphysical significance. It is rooted in the fact that "half-way" between opening a door and sawing wood is nonsense. The self-repeating paths are hidden off in the chaos in very specialized configurations of functional significance. Most variations on it (in the mathematically possible sense) lead to chaos.

This notion of mutual exclusion links the three worlds; subjective, mechanical and conceptual. It represents a natural type of unit about which to ground the tracing of the inter-relation of these spheres, as the cell or atom are appropriate units to other studies.

Although the life possibilities are astronomical, exclusions operate at a class level, and in successive stages, so that, appropriately defined, their number and character need not be so great as it might seem, and, as we will see, the class of possibilities that need to be processed are roughly limited to the past historical ones.

The subjectively ingressing generating universals are thus embodied or reconciled, in a compound of positive factors from

past history, together with a group of selective negative factors.

Time is prior to space. The structure of the generating U's can never be projected in any absolute sense, the projection being not felt, but merely implied in the way we talk. It so enormously simplifies the IP of solved situations to project that any other practice would, of course, be absurd. However, one must always keep in mind that this is a lie (as is the existential infinite), justified only by its usefulness, to be taken down as soon as it causes trouble, as it is sure to do when we reach a stage where the underlying causal insights need further differentiation.

(It might be objected that there is more than ordering even to music, hence that time ordering is not enough. The point is that our sense of tempo and tonality derive their subjective character from the class of other ordering they engage, other than the one they serve to help articulate. St. Augustine calls the soul a moving number, and theology the supreme mathematics, etc., another form under which to recognize the centrality of this abstract linear ordering.)

"Each part stands for the whole," viewed subjectively. Each decision takes up the whole of awareness, or involves it. This it is gets around the need of projected relations. Each feeling

involves in its symbolic completion, aspects of the whole. This form of grounding gets us around certain paradoxical aspects of the concept of an event in the quantum theory, wherein the local event seems (if read into a space frame) to involve distant effects. Eliminating the spacial or projected intermediary in linking the physics formalism to subjective categories, eliminates also these problems. Projections have mere useful mnemonic significance, but no metaphysical status.

The felt interaction is not between the words as such, but between competitive ingressing universals and associated maxims or heuristics that seem to call for incompatible behavior. It is expressed via the exclusion of specific acts (there is no collision in the universal). Decisional factors compound, not as space-time, but as plan. The concept of exclusion is itself semi-body independent (who will speak next or decide?), which aspect gives it the needed group coupling to rapidly extend any reconciled maxims throughout the group. There is only "one" game in the end, all games being thus coupled mechanically, and conceptually, the universals isolated being ultimately person independent.

10. PROBLEM SOLVING

The problem-solving view of the world provides a type of general functional form into which other aspects are usefully

fitted in process of tracing their relation to subjective access, or the content of actual feeling.

Defining problems more concretely as conflicts as to how to behave has many substantive aspects even at so general a level. Thus, in the law, it helps us recognize that conflicts over what a "contract" is are ultimately conflicts over what a judge will do. In mathematics it makes us recognize that the conflict over whether or not parallel lines can meet is a question about symbol manipulation. In physics it helps guide the recognition that the concept of simultaneity at a distance depended on operational counterparts (that turned out not to be true).

Now in problem solving as thus conflict oriented, we see that what is in conflict is, of course, not the acts themselves (though expressed via them) but rather the generating universals and associated maxims or heuristics that are implicit in them. (People really don't care about the act as such, only about the universal therein manifest. They really are that fluid inside.) Now decisions or acts are not right or wrong, only the causal insights that underlie them or compound them, are. Conflicting heuristics are specifications of self-repeating paths, as implicit in certain causal (self-model) insights. Insofar as these insights are compatible, then interaction leads to a rapid reformation and mutual adjustment. The human nervous system is very plastic, and very sensitive to the state of mind of others.

Isolated reflex formations, not part of a system rooted in certain causal insights, rapidly reform. Conflict is thus, ultimately, conflict of maxim forms, not of persons. The person is free, it is only the role is shaped.

The conflict of maxim forms has its temporal counterpart as competitive attempts at imposition on the group decision process. Error is always verbal. What is searched for in this process is the shape of the edges of breakdown of the competitive maxim forms. This is read back as a qualification of the causal insights on which these maxims are based. When the edges have been adequately charted, the felt denotative (person independent) content, which is the underlying causal content of the maxim forms, is reconciled, and the felt universals brought together.

The search for the repeating or resolving words in the field of possible words is a search for the abstract distinction that conditions or distinguishes the repeating paths. These abstract distinctions are, of course, only indirectly related to the given word sequence, as parts of operators generating it. Nevertheless, there is no felt distinction except insofar as there is a corresponding ordering distinction, a point that goes far to help us understand the character of subjectivity. (It is related to the fact that changes in gestalt or the forms of perception occur in jumps, continuous gradations being broken up into bands etc.) The word as mere tag, or carrier of position in abstract linear

ordering, individuated by sensuosity, takes up into itself, in the inductive ordering, the latent distinction which is spacially, or deductively ordered as the cue or factor conditioning it. From a point of view of the space ordering this may feel as absurd as if we were to order the surface of the ocean in terms of curvature indexes. But it gets at the whole subjectivity (ocean) because we only feel things in and as they effect ordering (all points on the ocean's surface have unique curvature indexes). Thus the fact that a given cue is present is experienced by us via the fact that a corresponding verbal phrase is engaged. The abstract distinction is enacted when it is made to enter into the linear ordering, and it is "discovered" when one recognizes (by secondary verbal response) the properties of this ordering making it a solution. We, in a sense, speak first and discover what we mean second, the pencil is wiser than the man (as Mach says). The words, as correlated, become (collectively) the bearers of these latent space distinctions. The unraveling of the relation between the verbal and space ordering (like the unraveling of a curvature representation of the sea's surface to reconstruct the sea) is the central content of the course, and NS model.

From the point of view of induction space, it is (as Thomas says) the thing itself that is incorporated into us when verbal response is made dependent on its cues. Spacial intermediaries

implied (but not felt) in systematizing the verbal forms, will include it, when before they did not. If the word is reduced to mere tag, mere position in abstract linear ordering, it is, nevertheless, that out of which all things are built up, via the individuated relation of nextness. The subjectivity in standing for the "that which" links words, "is" that which links the words. As Hegel says, the thing in itself is the thing for us. (Kant uses the opposite phrase to mean something else, to mean, in part, that matter is a transcendental category that can never be pierced. He does not disagree with Hegel).

The world may thus be viewed as all extrinsic, the relatedness of the abstract points which are the implied positions in the linear ordering itself.

Solution is a matter of love, or reconciliation, as all heuristics are expressions of the common goal function. But the process of effecting this reconciliation forces us to open the field of possibles to a causal depth, to verbalize the felt universal to a causal level of precision.

A reason for this, is that life presents such a rich variety of occasions, that if there is any latent error in the maxims serving to represent the ingressing universals or feelings, it is sure to be brought to the surface in the fight as among competitive formulations. This forces the grounding or analysis

of the heuristic components, to the point of reaching denotatively rooted or causal factors. Union with God has been called action in the perception of the cause. That the NS pushes to relatively causal C's in process of stabilizing adjustments in a given problem range, is a deeply orienting insight into the nature of brain function that bespeaks the basic plasticity of the CR formations.

This plasticity (insofar as one can go wrong, he will -- Murphy's law) forces the search to extend over the whole range of possible verbal alternatives (as Dirac says). It is this "absolute" plasticity (how easily counter-compensation can over-ride any isolated adjustment), of the NS which makes the inductive ordering a complete one. Structure cannot be projected. "Causality," as applied to any C is at best relative, relative to the given class of problems. If projection were possible, then the felt would not be reconcilable. It would, as felt, be (in part) particular. That the felt has, in fact, this universal status is not at all obvious. Its relation to the generation of emission is ambiguous. Short range effects suggest that the exclusion applies to the felt as such, rather than words, which would make structure projectable, constitute a collision in the universal, and deny the Whiteheadian or inductive ordering. Kant's recognition that only words can be wrong has deep experimental implications.

This de facto mechanical plasticity (in part related to the fact that we can order words any which way) is at the root of some of our most powerful moral insights. It is related to the dominance of the intellect as developed in Maimonides and Thomas.

The centrality of problem solving also helps us understand the causal basis of the defense of freedom. Freedom enlarges mobility, the field of possibles considered, and mobility (as in chess), is the key to power as soon as one has isolated maxims precise or consistent enough to define the repeating paths within it. (Before then more freedom is a weakness—as slaves beat unorganized "free" men). The relation of power to mobility has its obvious problem-solving as well as related power aspects. This premium which mobility creates can be viewed as helping force isolated maxims into theoretic form.

All these loose comments on problem solving need a lot of underpinning, of course. They are presented here as part of the introduction to help the student appreciate the motivation and potential significance of aspects of the NS model to be presented later.

11. ON VERBAL C

The notion of grounding on verbal C's has certain paradoxical aspects, and it may be well to set aside certain overgeneralized objections to its very possibility before we look

at the matter more concretely. In addition, doing so helps clarify something of the peculiar logical status that a causal self-model is involved in when used to organize decisions.

Since words can be emitted any which way it might seem that no such C could be isolated at all. One gentleman turned a somersault on an office floor just to "prove" to another philosopher that he was unpredictable.

It is an easy matter to build a machine in which a given set of words can, with some finite probability, come out in any given finite sequence, yet nevertheless have much significant correlation within emitted sequences. Statistical components and the proper tailoring of the relative and conditional character of the correlations, can quickly provide models that meet such overgeneralized objections. (As for "contrariness," a somersault equivalent is the easiest of things to duplicate.)

The status of the C's isolated needs some careful attention. One can always say a person did this, that and the other. The problem is to discover where and how to break up or abstract the order manifest in this chain, so as to bring it under common universals, which is what we mean by "explain." One can classify or order any which way. We can add up the number of pencils on a man’s desk and divide it by the number of cars he sees in an afternoon and index desk owners in this way. Although this index

is doubtless correlated to many things, it is not optimum to many purposes.

In picking on the word, we are saying that class concepts defined in terms of verbal generators, are the optimum distinctions in terms of which to abstract class correlations to systematize the order manifest in, or relevant to, the understanding of our subjective world.

The word, in this sense, is very much like the atom. It is not a subjective isolate, any more than an atom is. We infer the presence of a certain word by felt signs, just as we infer the presence of sodium atoms by the yellow flash of its characteristic spectral line as it enters the flame. But the sounds or print we feel are no more words in this sense, than the yellow flash is a sodium atom. The word, like the atom, is a highly sophisticated "construct of reason."

Why do we attach such importance to atoms in physics? Because the IP processing of correlations defined in its terms minimizes problem solving procedures. Because class correlations can be optimally formulated by means of its characteristic identifying signs in a form best adapted to the explanation of certain parts of the order manifest in nature.

All this is even truer of the word. The word C's are the spectroscopy of the brain. They are the most delicate probe we

have for getting at the character of the underlying "wiring diagrams" of nerve linkages. They, like atoms, are the pivot-points via which the significant correlations run, and in terms of which other C's are most conveniently viewed as constructed (only more so).

These successfully abstracted verbal C, as will, have an "institutional," (O) status that needs careful consideration. Here we are using the term O in Malinovsky's sense, to refer to features defined in terms of their conditions of repetition as part of the culture, which conditions ever turn out to be functional, that is to say, to be the de facto conditions of stability of the given cultural cycles of which they partake. (Malinovsky calls the O element the concrete isolate of cultural anthropology.)

An OC (institutional correlation) is a relative and shaky thing at best. They are constantly being differentiated and improved. New causal insights, new conditions, could and do differentiate or change any one of them. Their validity is relative and statistical at best. But although the OC are shaky, and always full of latent inconsistencies, they are the best we have or can reach for the transition leap to subjective categories. If they are always a half-sinking plank, we, nevertheless, have been able to repair enough of the worst last

leaks before new ones emerge so as not to sink, and that is enough. And enough is enough.

The attempt to give anything "felt" more than an O status, the attempt to project it, or make it absolute, backfires, or over-specifies. We view God as through a fog. We have but a negative image of God. This is not a block to a formalization of value issues; it is merely a fact that must be explicitly recognized in the machinery of such formulation.

The search for self-repeating paths is a transcendental search in which OC are made ever better, that is, capable of holding up over wider and wider ranges of interaction or possibility (incorporating more history). To achieve this the O's must, correspondingly, become "thicker," or more complex. As we cut through new layers of structure in matter, we also build better self-models, in each region reaching to new orders of precision and honesty.

The self-repeating paths are like a delicate web thrown out in the chaos. Its connectivity is constantly being reformed, as new words or distinctions enter into the shaping of the cycles.

Nevertheless, there is a solidity to the word that more than matches that of the atom. Physics concepts are working projections at best. Everyone knows they are nonsense when extended to larger and smaller magnitudes than that available in

the data from which they were abstracted, yet to simplify the IP, and to help force up new X, we talk as if their hold were unqualified.

The word, as distinguished from the atom, however, stands as a merely abstractly defined tag, it stands for the possibility of relevant separation, or distinction (though the relation to projected counterparts is neither one-one nor unique). As such the word has a certain eternal status, not enjoyed by the atom. It cannot be outmoded, yet it remains even more concrete.

Changed connectivity may no longer treat the atom as basic, but the old carriers of isolated functional distinctions, however regrouped, live on. They are the "points" out of which the world is built. The connectivity (nextness) of their class abstractions change as more individuate out, but a functional distinction once incorporated, lives on forever.

This fact is implicit in the recognition that science differentiates, it does not change. Quantum theory contains classical mechanics as a special case.

But the thread of continuity is most distinctly manifest not in that projected, but in the will, or felt. There is an eternal core in all heuristics which makes them openable, and the underlying felt eternal or ever reconcilable. This core's eternality is indirectly reflected in the fact that science

merely differentiates. The word is the concrete enacted base which struggles to reconcile mathematically in itself these ingressing universals and thereby make them manifest to us. The word has thus its foot in the temporal and eternal at once. As bearer of the distinctions reconciling universals it carries abstractions which are eternal, while being at the same time always unique and concrete.

The atom, by comparison, has but a passing status. Its link to subjectivity goes via the word. Physics is a systematization of certain person independent aspects of a special class of QA. To reach now felt subjective categories we must incorporate the qualifying variables of actual practice into the physics discourse, that is complete the incomplete C into which their forms, as incomplete forms, can and do enter.

To build the correspondence to subjective categories it is the relatively simple VC (verbal C) structures that afford possibilities of natural transition, not the incomplete VC of physics, which, when the C's are completed, are represented by a rather complex class with endless subjective links.

Old philosophers tended to confound causal explanations with simple formulas, thus treating under other "non-causal" categories types of arguments, as from analogy, which can be made rigorous enough and "scientific" in a more flexible formalism.

(Physics jumps the gaps to chemistry using analogies in essential ways as the calculations cannot be made.)

Nevertheless, trying to find tricks of construction to isolate significant VC can seem rather frustrating. (Correlations between the class "articles" and the class "nouns" are not very exciting, though not perhaps without significance.) The trick for doing so (like Descartes's trick of mathematically organizing motion in space that opened so many fields) is to examine the QA. This is Hegel's great discovery (one aspect of the dialectic), and is forced on us by the practice involved in computer design to duplicate corresponding human intelligence.

The task of compounding or explaining the VC in QA goes via the process of understanding how the QA sequences are compounded or generated by the sensuous content of denotation. To make this jump, we have to orient the QA as ultimately concerns about maxims defining the selfrepeating paths. We have to treat the QA as incomplete forms, completed via the way they enter into heuristics. This brings the word back into reference to itself, and so breaks vicious circles (such as Wigner's) by, in effect, starting with them openly and explicitly.

A lot more needs to be said but this should be enough of a starter to orient the logical status of what we are up to.

12. SUBJECTIVE ACCESS

Verbalization procedures (does this hurt?) provide access to internal states of the mind and body, available in no other form. Actual problem solving always involves this passage from form to feeling, and feeling to form, it involves the reconciliation of subjective access, with the planned ordering. Roughly speaking the form associated with a feeling can be regarded as the ordering it serves to engage, and vice versa. "Knowing" the feeling (via our inside route of subjective access) it may take a long time before we can identify the associated ordering it will engage. (Am I really so angry I will hit him?)

Since contradiction goes via the particular, it always involves the reconciliation of competitive forms of passage from form to feeling. The final reconciliation involves the identification of the place of the underlying competitive feelings in a causal model, organized by common universals. This process of identification is one aspect of the elaboration and qualification of the verbal order needed in order to reconcile the competitive U's all at once.

Now different types of problems abstract from the common underlying decision process in different ways. There is a strong tendency to regard these ways as mutually exclusive to feel that one must be right, another wrong. What we must keep in mind is

that there are endless ways of ordering the same facts, of abstracting the same subjectivity, and that they can be right or wrong only insofar as the classification scheme is so compounded as to yield falsifiable predictions.

Many philosophic problems carefully analyzed boil down to arguing whether a line interval is "really" made up of a sum of powers of Y, ($a + bY + cY^2$ etc.), or really made up of a sine series ($a + b \sin Y + c \sin 2Y$ etc.), no method of abstraction is "righter" than another. Physics is not so much a model of the world, as a systematization of wide classes of models. It ends up a different "model" in the context of every problem.

So, too, a theory of the forms of subjective access will not give a preferred decomposition, but will appear as a theory of the interrelation of all the decompositions implicit in dictionary usage. A form of decomposition does not, of itself, imply anything about behavior, except in the indirect sense that as certain forms are easier for one purpose than another, it is likely that the purpose in mind is the one for which the decomposition was designed. But this different usefulness does not make each view incomplete. Each view may be a complete one, and all facts of experience ordered in each, even though they are very different. Society, self and nature need not be regarded as models treating three parts of our experience, but as three ways

of ordering the same total experience. Such comments lead, in an obvious way, into a discussion of the doctrine of the trinity.

An NS model can, of course, be viewed as a special case of physics models, just as those of geology can. But (as in geology) this possibility is rarely elaborated in practice, an exhibition of the possibility of doing so in principle being enough. From the point of view of the translation to subjective access, we can also view physics models as aspects of self models, which later not only have a simpler relation to subjective access, but also have a core that holds up transcendentally as physics models keep changing.

In practice the NS model serves to formalize the intermediate steps by which the forms of subjective access are identified as parts of heuristics defining the self-reinforcing paths as implicit in the causal facts physics systematizes about the field of possibles. Such an identification turns out to be necessary in conflict situations as nothing short of causal insight satisfies people, and, in addition, the nervous system is plastic enough to probe to that depth. Conversely, such causal (or invariant) correlates, once isolated in the universal models of physics (or in sub-models ultimately thus justified) are effective in stopping dispute. The relation between causal invariances of the heuristic components, and the possession of

enough psychological weight to capture emission time, goes to the heart of the NS model to be developed later.

The problem of compounding the order manifest in verbal emission is not as vast as it might seem, once the right logical handles are isolated. It can, after all, be abstracted aspect by aspect, and our concern is limited to those few aspects in conflict.

The key to doing this, as we have said, is the orientation of the wiring diagram of nerve linkages, via the way a given linkage effects the ordering of emission of our behavior. The importance of behavioral categories in classifying and inter-relating, that is to say, ultimately representing emotional and felt categories is a key isolate of our classical philosophic and mystical tradition. Thus Spinoza develops an elaborate "geometric" theory of the emotions, as internalized motor patterns, regarding, for example, hate as the internal aspect of a felt situation in which someone else was preventing us from doing what we wanted to do, when nothing constrained him to do this. This method of thinking contains a paradigm which we will elaborate into a theory of NS operation. The arithmetization of the geometries earlier mentioned contains (in embryo) what can be viewed as another type of example of the development of a seeming passage from felt categories (lines and planes) to ordering one (numbers).

The key link between felt categories and internalized motor categories serving to represent them, goes via the concept of a question and an answer. A question is regarded as a type of internalized motor random search (often involving potential symbol manipulation) and an answer, that which serves to stop this search.

This type of thinking is essentially mystical, and to be distinguished from behaviorism. Behaviorism was really a policy of concentrating on the details of behavior and ignoring the inner life. Mysticism is also behavior oriented; it emphasizes the relation of all feelings to doing, viewing the world and all experience as a moral parable to be deciphered. It differs from behaviorism in that rather than ignore the inner life, it uses the link between this inner life and behavior as the key to plumbing its depth.

The jump from behavioral to verbal levels of ordering is one of the key semantic problems. If behavior is treated as denotatively rooted, we are right back into all spacial dilemmas. The key, roughly speaking, is to regard the motor ordering as emerging from the development of a style-independent classification or indexing of the verbal ordering. The motor ordering is implicit in this indexing. This keeps us within verbal categories. That the motor ordering also manifests mutual

exclusion, and to that extent is word-like, makes it an especially appropriate half-way link between word and world.

We have now to take these hints, and this general type of classificational framework, and see if they can be made useful in developing a theory to organize the basic known facts about the NS.

The theory of operation of the NS will provide us with a systematization of translation procedures for representing the denotative groundings of the various fields, back into the word, and thereby bringing all fields (via various stages of implied construction) under the common universals of physics, perhaps better called natural philosophy. We will then set about applying these procedures to specific fields (mathematics, politics, esthetics, etc.), to make them in effect as they now stand, part of a common syntax via these linking procedures .

These linking procedures are not trivial, however. They have many substantive implications for the fields they link. In fact, they will provide powerful underpinnings for certain positions, but more generally serve to provide a way to interlink and reconcile conflicts within the various fields which it is impossible to resolve from within that field treated in isolation.

A new self model has a peculiar logical status, since we possess a sort of special inside relation to it. In some respects it is not so much a model as just a matter of time. The old fields in isolation from one another created all the answers it contains, and even all the needed tricks for linking these answers. In struggling with old inadequate models, struggling to force all facts within them, each field developed a set of competitive views, and was even led to a study of the inter-relation of these competitive views. Within the pattern of isolates thereby developed in all the fields are a subset which, strangely enough, link-up to form a symbolically complete system. All that this study adds is the shock of recognition of this completeness (if it adds anything) for not only all the pieces, but even the general guides and programs needed for linking the pieces, have been sitting around the scenes now for not long, but at least some few years.

The generation of new self-models as we differentiate through further layers of matter, may (as in the past) be expected to repeat such characteristics. The rules of translation to subjective access become inadequate and break up into argumentative types (see Fig. I). Once these generate enough collisions, a new translation procedure (and implied self model) can be crystallized out of the pieces found in a study of the

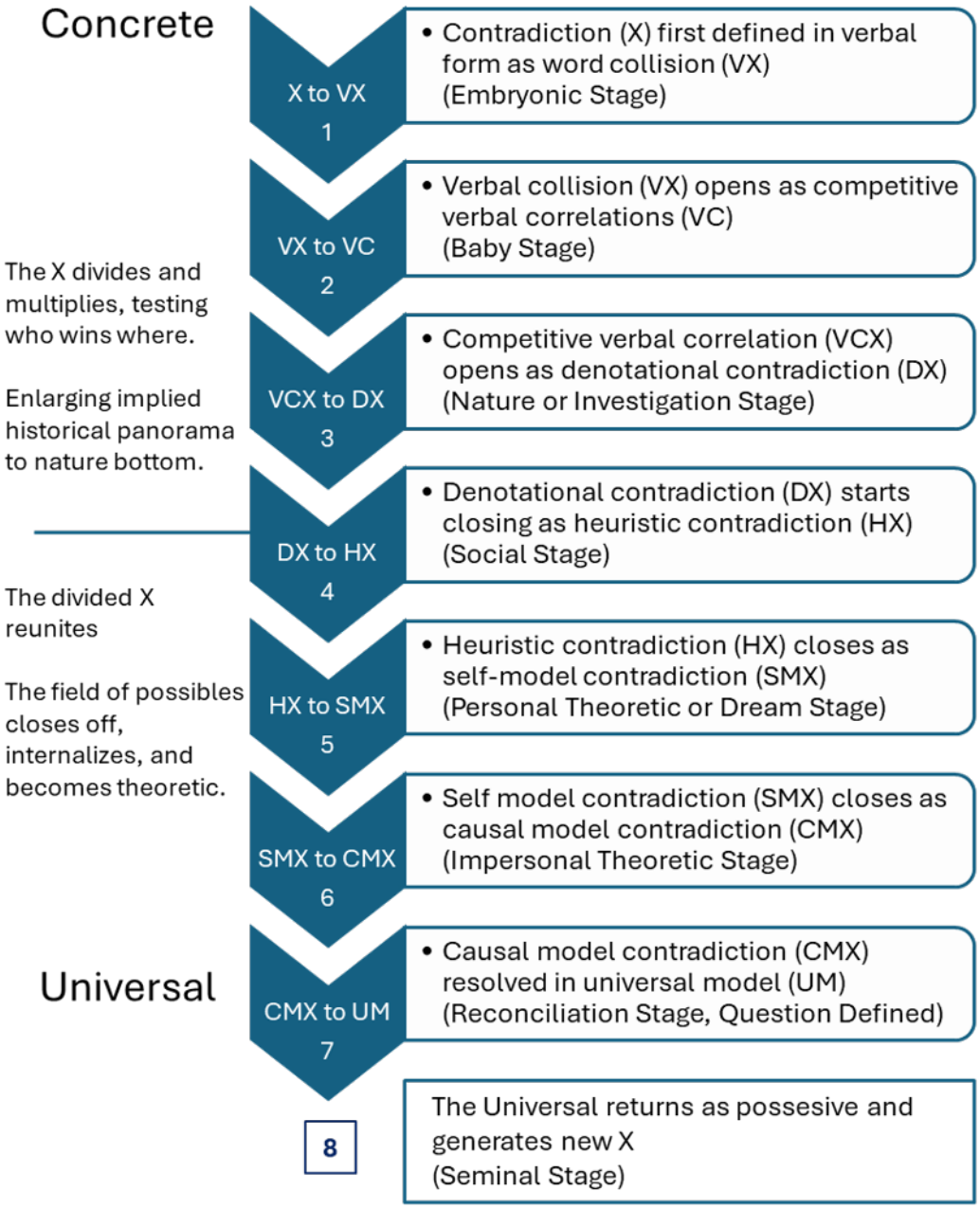
dynamics of the argumentation that the use of the old procedures induces.

To take hold ideas have to become part of a system, and that system is, ultimately, the planning of daily life. Until daily life problems can be processed in the new vocabulary, it cannot take hold and does not really form a system. Indeed the many specialized tricks, the mountain of practical techniques via which a given system comes into contact with daily life, are its real lasting content, and the "system" but an ornament on top, which each new self model radically reforms. A system can’t become possessive till it has elaborated sufficient relevant categories. It is only as the rich machinery of multiple applications fills in that a "system" gains life and energy. (At first most of this filling in is just a rewriting of the old in the new terms, but if the "system" is significant the process of doing so removes many X and opens new issues). The system has a catalyzing effect on these many practical procedures or techniques that are its real content, which lasts until its implied task is worked out, after which a new self model is forced up which reduces the former task to a routine tool in the new. After we have learned how to clarify our value schemes to a point where we redesign bodies and brains as we redesign automobile plants (or constitutions); after we have carried out

all the latent possibilities available in terms of biochemical reorderings -- new levels will surely emerge.

Meantime, in the realization that this is but a passing concretization of the eternal truths of our religious tradition, we will set about presenting a functional model of the operation of the nervous system, in stages of progressive concreteness, till we reach the causal level of explanation, relative to the present class of technical issues.

Figure II. The Formal Passage of the Contradiction (X) from Concrete to Universal Form.



The X is most concretely experienced as (top box) the competition of excluding words for emission. It is not first felt there, but rather in some more middle region of the diagram, as competitive heuristic, becoming both more concrete and more

universal as the situation clarifies (What is the question?). It takes a lot of clarification before the concrete point of the X can be so sharply and well defined. This is, therefore, merely a formal diagram.

The passage from concrete to universal is a process of gradual opening out of the internalized history which underlies and generates the verbal X. (This enlargement of the historical panorama involves a lot of acting out, but this is part of the process of getting from the heuristic middle to both ends of universal and concrete, and is here assumed as already done.)

This opening out of internalized history stops at the person independent subjective bottom, or nature. This opening out multiplies and tests the forms under which the given X can be experienced, to their limit. Once a person independent and objective or secondarily "probe-able" content is reached (defining which branch of the X wins where), however, the tide shifts, and further (inner) acting out serves to close off (rather than open) the field of possibles. This bottom stage is both "objective" and subjective at once (as Kierkegaard notes). Feelings are never stably isolated even subjectively inside ourselves, for ourselves, till pushed to person independent objective forms.

The return, closing off the field of possibles, bit by bit, sweeps, bundle by bundle, the multiple forms of the divided X together. (Unqualified form can be connected and is already latently theoretic.) As it does so, the closing negations gather into progressively more theoretic and systematic forms. With the bringing back together of the whole detailed historic panorama the X is resolved, (i.e. defined as question) and one passes out into action, or elaboration, and the generation of new X.

(1) presents the most concrete form of the X as verbal collision, in a blind embryonic stage of pain.

In (2) the elaboration the verbal X (1) generates, has led to the isolation of competitive verbal correlations.

This is the initial self-investigation or baby stage of acting out. It leads to the isolation in the pain of certain compulsive attitudes (verbal correlations) with which to probe the environment.

With (3) we have individuated (the "when each wins" of) the motor compulsions (verbal correlates) enough so that they may be uniquely associated with environmental factors (i.e., taken into transference by sensory cues emanating from the outer world). This stage symbolizes the finding of a bottom, the successful reflection out of self of which Hegel speaks. In it we pass into outer investigational action, finding (or generating) person

independent or denotative roots. This is the nature stage, with its multiple niches where each aspect clearly wins.

(4) starts the abstraction of the generated sensuous root, or nature. (Nature here appears as an emanation of the will.) In (4) the opening X finally reaches relatively stable (though multiple) objective forms, which leads to various local stages of the beginning of a closing off, in the form of articulated competitive heuristics. The probing process in reaching something possessive and definite at the bottom, finds elementary forms or heuristics that are (locally) relatively causal. The return starts as the social stage. It is the beginning of the reflection back into self. Having gotten what one wanted outside, the successful felt resolving abstraction, we now set about dissolving and unravelling inwardly the theoretic significance of our sensuous catch.

In (5) the competitive heuristics of the social X stage begin to link up as self X, and self model. This is the personal or dream phase of the theoretic synthesis. It pulls together roughly the social panorama, but not yet the detailed "absolute" panorama of nature itself.

In (7) the reconciliation is pushed to the absolute, or mathematical level. At this level the X or question is felt as resolved and objectified, (i.e. denotatively defined), its place

found in the implied universal models of physics. The systematization of the far-flung and divided initial X, caught in nature, stops at nothing short of this full identification (and hence reconciliation) in the universal models of physics. If there is no (formal) stopping place short of here, there is, in fact, a stopping place here. "Unexpected" simplifications make the denotative framework adequate. Note that it is syntactic, and possessive at once, being the final court of last resort where the subjective has its theoretic character defined or articulated, and one passes out into "death," the subconscious routines of work, problem solving, and task which are ultimately but an extended part of the metabolism. This final syntactic phase is to be contrasted to the initial one. In (1) words were related to one another by blind "force," as panicky brute beasts, trying to drive each other out of the narrow gate to emission time, (the question unknown). In (7) words are related via their indirectly implied positions in elaborate (causal) patterns, or groupings, and experienced with detachment, (question defined).

(8) begins a new cycle. The felt universals, reflected back into self, and made possessive via their theoretic identification, here elaborate subconsciously as well defined task, pushing towards the generation of new X, the insemination with leisure of new pains, new needs, new blind, ambiguous

collisions of an as yet "non-verbal" middle stage which long acting out will again clarify into this formal ladder form.

It must be remembered that this is only an ideal or formal scheme. Actual X's can be (sometimes usefully) oriented as blocks in this ideal "flow diagram" of the solving process, and located at (or emphasizing) sometimes one level, sometimes another. All level aspects clearly co-exist at once, differences being question of emphasis.