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Floyd Merrell

A SEMIOTIC THEORY OF TEXTS

APPROACHES TO SEMIOTICS [AS]

A Semiotic Theory of Texts

Approaches to Semiotics

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To my parents

List of Propositions

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List of Definitions

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Contents

Introduction

My book will have no instruction to impart to anybody. Like a mathematical treatise, it will suggest certain ideas and certain reasons for holding them true; but then, if you accept them, it must be because you like my reasons, and the responsibility lies with you.

Peirce (1960, 1.11)

0.10 I begin this introduction, as a way of entering into a theory of texts, by discussing the general implications of the following inquiry. I do not believe it is necessary here to survey the range of text theories and methods of text analysis. Yet I feel I must, as succinctly as possible, relate the scope of this inquiry to much current work in the field. Next, with the purpose of giving direction to the methodological perspective I have developed, I briefly compare certain aspects of Chomskyan linguistics and Wittgensteinian language philosophy which have served to motivate many of my ideas concerning the construction and perception of texts. Subsequently, I synthesize key principles from cybernetics and from the thought of C.S. Peirce which have influenced my thinking. With this my introduction will be concluded. Consider it to be like an indexical sign pointing toward the text, which, when perceived in its totality, is like an icon, a map of the territory within which I have wandered for the past few years. The reader might encounter many unfamiliar signposts, but the journey, once finished, will I hope offer him or her a vision of this map in one perceptual grasp.

0.11 Lipski (1976, 191) states that: "With modern linguistics making frequent incursions into the domain of literary narrative studies, there has been an increasing healthy interaction between linguistic analysis and more traditional methods of literary investigation." Unfortunately, I am afraid this interaction has yet to produce satisfactory results. The question to be resolved is: Can linguistics provide an adequate model for the analysis of texts? Of course I cannot in this introduction effectively address myself to this issue. I will attempt, however, to explain briefly how this study differs from a variety of current linguistic-based text theories.

Generally speaking, many aspects of recent theories of texts are subsumed within the more comprehensive theory I have constructed. The chief distinction between these trends and my theory is that text semiotic, as I use the term, is not strictly limited to linguistic models or to literary texts. In the broadest sense it includes linguistic as well as extralinguistic (general cognitive) aspects of *all* written texts. Consequently, one of my objectives has been to bring new and relevant material to the attention of those who are at present working exclusively in literary text theory.

Let us turn attention first to French structuralism. Following Saussure's binary model of the sign, the notion of "distinctive features" put forth by the Prague school, and Hjelmslev's "glossematics," most French structuralists conceive binarism to be the fundamental defining principle of the human mind.[1] Consequently, "binary logic" is presumed to underlie all coded systems, linguistic and otherwise. It purportedly reveals the mind's proclivity for classifying the world into oppositional categorical frameworks, and for constructing coded messages derived from these frameworks. Armed with this analytical tool, Barthes (1966), Greimas (1966b), Kristeva (1969), Metz (1974a, 1974b), Todorov (1969), and others postulate a formal homology between texts and sentences, and then subject their corpus of study to descriptive methods common to structural Linguistics. The assumption has it that linguistic methods can be used to explicate literature systematically (Culler, 1975, 20-24).

This rather uncritical use of linguistics has been countered on various grounds.[2] To cite a few examples, the structuralists' analytical methods tend to produce static classificatory schemes (Ricoeur, 1968; Lefebvre, 1971), overuse the linguistic model (Hendricks, 1972; Jameson, 1972), or abstract in extreme form the characters and narrative events of the text (Chatman, 1969; Weimann, 1973). In addition, some structuralist analyses appear incapable of accounting for such characteristics common to literature as metaphor, imagery, irony, and ambiguity, while others fail to analyze satisfactorily the relationship between reader and text (Culler, 1975).

From a slightly different perspective, and commensurate with Propp's (1968) analysis of folktales, Bremond (1966) proposes a "logic" of narrative actions, Greimas (1966a) a "logic" of the agents of narrative action, and Todorov (1966) the universal "categories" of stories. And these "logics" are indelibly Artistotelian (binary or subject-predicate oriented) in character. The problem is that, with respect to the relatively complex literary text, such Proppian-based models tend to minimize complexity of characters to consider them as functions of plot (Chatman, 1972). In addition, anthropological studies of folktales such as those of Dundes (1964), Georges (1970) and Colby (1970) are also based on Propp's model, but, similarly,

their relevance to the literary text is questionable (Hendricks, 1973). The same has been said concerning Levis-Strauss' myth analysis (Donato, 1967; Boon, 1972).

In short, many structuralists have attempted to develop a method of analysis which elucidates universal categories and functions of narrative texts. However, they generally offer programmatic theories which are limited when considered in the light of relatively sophisticated texts. With these failings in mind, I have attempted to formulate a more broad-based extra-linguistic conception of text semiotic, rather than, as Barthes (1970) once suggested, presupposing linguistics to be the stepmother of "semiology."

Outside the structuralist movement, other linguistic methods of analysis have been put forth in recent years. To mention only a few, Ohmann (1967) once maintained that the text can be effectively explicated through a sentence by sentence analysis using linguistic methods; that is, the text is a whole which is understood by individual analysis of each separate part. Following different paths, Aarts (1971), Fowler (1969), Butters (1970), Levin (1962), Thorne (1965, 1970) and a host of others study poetic style in so far as it deviates from natural language. Riffaterre (1966) follows a strict lexical approach postulated on the existence of a unique poetic language. Harris (1952) and the "discourse analysts" describe a text as a long sentence constructed by means of connectors. And Garvin (1964) even goes so far as to suggest that lingustics provides the precise and necessary algorithms for analyzing all manifestations of human cognition. In view of this trend, it must again be emphasized that lingustics does not necessarily provide an automatic procedure with which to explain all coded phenomena.[3] To suppose that the analytical methods used in linguistics are directly applicable in their totality to literary texts is to overlook inherent differences between texts and language, writing and speech.

More recently, there has been a movement toward "text grammars," programmatic theories of text generation following a Chomskyan-like notion of "text competence."[4] The objective has been to provide a viable alternative to earlier structuralist models. The "text grammarians" in general attempt construction of a "generative poetics" as a counterpart to generative grammar by introducing formal and quantitative methods to give more comprehensive and systematic account of the literary text. However, text grammars, like the Chomskyan model, are in general abstract fabrications which offer little to the analyst interested in concrete works of art.

Moreover, even though the proponents of text grammars have rejected the static tabular nature of orthodox structuralist taxonomies, they usually commit another error in common with the structuralists: one linguistic model is (somethimes blindly) replaced by another. Undoubtedly certain linguistic

elements can provide the foundations for text structure (Halliday & Hasan, 1976; Meyer, 1975). Rules might even exist that may ultimately determine the general structure of stories (Chatman, 1978; Prince, 1973; Rumelhart, 1975). But this does not insure that strictly applied linguistic models will elucidate the underlying structure of texts.[5]

A problem with the early text grammars was that they focused primarily on the syntactic aspects of texts, or on interpretive semantics, following Katz-Fodor and Chomsky. Later incursions into Montagu grammar to develop descriptive tools, and studies on the relationships between generative semantics and logic have perhaps helped to remedy part of this problem.[6] Also, during the past few years there has been interest in the pragmatics of narratives, with influence from "speech act" theory (see van Dijk, ed., 1976). Van Dijk himself perceives this change in direction to have resulted from the realization that "many properties of sentences and discourses, and *a fortiori* of verbal communication in general, cannot be accounted for in terms of grammatical theories of the usual kind." He goes on to suggest that what is needed is a "pragmatic component in which rules, conditions and constraints can be formulated based on systematic properties of (speech) acts and communicative contexts" (van Dijk, ed., 1976, vii).

It must be mentioned, however, that I depart from most "speech act" theorists and pragmatists in so far as they tend to direct their attention primarily toward the "speaker" and "speaker intentions." My focus rests more directly on the "hearer," the reader. Furthermore, van Dijk's (1977a, 1977b, 1978) current interest in the "cognitive processing of discourse" fundamentally involves what the reader recalls from stories rather than an attempt to understand *how* the reader derives meaning from the text. The latter will be my aim in this book.

0.12 This section provides a background for the notion, developed in this study, that an adequate model of text construction and perception must incorporate a formal description of the human capacity to follow (but also to alter) Wittgensteinian-like conventional rules of language use in texts. According to the Chomskyan hypothesis, all normal human beings possess an innate capacity to internalize and speak a language (Chomsky, 1965). I will not argue for or against this hypothesis, nor will I be concerned directly with Chomsky's notion of language competence. I will, however, assume that language use by and large follows some set of culturally-grounded conventional rules which partly dictate where, when, and how we utter sentences, while competence determines the syntactic and certain semantic constraints on our utterences.

This public agreement at the outset appears similar to the later Wittgenstein's "language-games" within public "forms of life" which include

sets of tacitly presupposed ways of attaching meanings to the words used in everyday speech activity.[7] Of course, Wittgenstein never claims that his conventions of language use are, in a Chomskyan sense, universal or biologically-based. Nevertheless, at times he appears to imply that such notions like language use, rules and roles are the outward manifestation of some, as yet undefined, set of inborn potentialities and proclivities that govern the formation of culturally-grounded conventions determining what can and cannot be said, and what can and cannot be thought (Disco, 1976; also Pole, 1958). In this respect, I will assume that the development of collectively shared conventions of language use must be the result of some inborn potential.

Hence I use what I believe to be eessential aspects from both the Chomskyan and the Wittgensteinian hypotheses, But I attempt to do so without confusing them. Actually, as I hope will be demonstrated throughout the course of this inquiry, the two hypotheses are in a way complementary rather than merely contradictory. In this sense, they should not be compared at the same level.[8] When they are so compared, confusion inevitably arises. Such confusion is similar to what Ryle (1949) calls a "category mistake" – fusion of two or more ordinarily disjoint entities or classes of entities.

For instance, Wittgenstein alludes to an unspecified human propensity to follow *culture-bound rules* of meaning while he attempts to describe the use of these rules by his rather vaguely defined "language-games." Chomsky, in contrast, believes that it is possible explicitly to formulate a set of *universal grammar rules* which are derived from a specifically human capacity to utter and understand potentially an infinite number of sentences in any natural language. Wittgenstein and Chomsky are speaking of different, even incompatible, domains. The point is not that one is supposedly a "behaviorist" while the other is a "rationalist," or that the epistemological foundations of their models and methods differ radically. The important issue here is that the focus of their respective inquiries rests on distinct levels (see Leiber, 1975; Fodor, 1975).

Like this Chomsky-Wittgenstein distinction, I believe a distinction must also be established between the ability to construct/perceive written texts on the one hand, and the ability to generate/perceive the language *of* those texts on the other; that is, between text semiotic and linguistics. To fail to be aware of this distinction is equally to commit a category mistake.

My reasons for making such a distinction are as follows:

Language is the medium, it is not the text. The difference between the linguistic level and the extralinguistic level of texts is not always obvious since all written texts are necessarily constructed by the use of natural or artificial languages. However, I will argue that texts are not reducible to the

status of language, nor can the sets of statements in texts appropriately be studied in the same way as the linguist studies sets of sentences. As was stressed above, then, this study counters the theses of many structuralists and others whose faith in linguistic models prevents them from adequately accounting for the fundamental differences between languages and texts. Texts make use of language to convey, at conscious and nonconscious levels and by some as yet undefined capacity, novel ideas, concepts, opinions, desires, emotions, etc. about the world and about other texts. To do this inevitably entails also the abuse of language: the creation of new meanings and new figurative modes of expression.[9]

Texts must manifest the appearance of novelty. All texts present something which appears to be to a greater or lesser degree "different from" what exists in each and every other text; if not, a text would hold little interest for the reader. In this sense, all texts must provide at least the appearance of novelty. This appearance of novelty is appropriately the product of a figurative mode of expression lying behind the surface linguistic manifestation of the text – which I will call the textual "symbol system." Novelty in, say, scientific texts, will chiefly consist of rigorous arguments and the formulation of hypotheses and models by means of axioms, propositions, inferential statements, and perhaps observational statements. In contrast, novelty in literary texts is derived from aesthetic perspectives. Consequently it might be assumed that the substance of literary texts is largely "subjective" rather than "intellectual." I will argue, however, that there is no all-or-nothing boundary between the two types of texts – what is more aesthetically pleasing than an elegant mathematical proof? In this respect, the appearance of novelty in all texts stems from the same cognitive base.

Novelty depends upon culture-bound perspectives. The ability to construct/perceive at least the appearance of novelty in all texts represents a certain capacity which is something "other than" linguistic competence. It entails not a species-specific capacity merely to follow grammar rules but a capacity to generate and perceive change (difference) by means of certain culture-bound conventions (rules) of language use in texts, and to defer from those conventions (rules) to generate and perceive change (difference) by the creation of some other set of conventions (rules). To confuse either linguistic competence or ordinary language use with the capacity to construct/perceive novelty in texts by the distortion of culture-bound conventions of language use is precisely the category mistake I spoke of above.

The capacity to construct/perceive novelty is the product of an extra-linguistic cognitive mechanism. However, this cognitive mechanism is not "the same as" what might be conceived as an innate linguistic mechanism.

If it were, we would always tend to construct/perceive texts in fundamentally the same way, chiefly using grammatically correct sentences rather than intentionally or unintentionally abusing language in order to express and to understand novel artistic, scientific, or other insights. We would always intend to write/read words literally and in customary ways rather than figuratively and metaphorically. We would simply conceive/perceive, in machine-like fashion, a potentially interminable number of sentences, but we would be hardly capable of new thoughts, creativity, wild flights of imagination. In short, there would be no conceivable reason for us ever to strive to depart from our sets of norms.

Hence in this study I will attempt to construct a hypothetico-deductive model capable of accounting for a cognitive mechanism for constructing/perceiving potentially infinite variability in an unlimited number of texts over an indefinite period of time.

0.13 A conjecture, derived from cybernetic theory and implicit in this study, is that construction/perception of texts entails two complementary processes. Utterances, in the ideal linguistic sense, can be described at a level of relative simplicity. On the other hand, text systems manifest levels of increasing complexity or variability. Although maximum opposition and contrast can, as Jakobson demonstrates (Jakobson & Halle, 1956), exist at relatively simple levels of organization, as complexity increases gradations begin to replace discontinuous units; discrete entities give way to progressive *differentiation* (Laszlo, 1972). Consequently, the extralinguistic aspect of text systems possesses fewer concise boundaries but greater ambiguity, vagueness, and multiplicity of meaning than language systems.

In general, therefore, it can be stated that the degree of organization and complexity increases while structured simplicity decreases during progression from lower to higher levels. Such is the case when we proceed from, say, atom to molecule to organism, or with respect to the present inquiry, from phoneme to morpheme to sentence to text (Koestler, 1969; Polanyi, 1958). In this sense, the laws defining the order and organization of lower, less complex systems are not necessarily equivalent to the laws governing more complex systems.[10]

In addition, this distinction between structured simplicity and organizational complexity bears on the above mentioned notion that all human beings tend to vary somewhat from well-worn linguistic and conceptual pathways. And, variation from well-worn pathways in light of cybernetic theory prompts brief though warranted discussion of the principle of "entropy." According to the second law of thermodynamics, a closed physical system tends to move in the direction of increased entropy (i.e., a state of increasing probability of "chaos").[11]

For instance, if one-half of an iron bar is heated and the other half cooled an organized system exists whose occurrence in nature is highly improbable. Assuming that there is no heat dissipation and that the iron bar is an ideal closed system, after a period of time the temperature from one end to the other will not vary. Organization has decreased as the bar attained the most probable state of affairs. It is important to note from this simple example that: (a) the second law of thermodynamics requires the existence of closed systems, and (b) an unnatural increase of organization in the inorganic system requires the intervention of a biological organism. Unlike inorganic systems, living organisms maintain themselves in a progressive state of improbability and, in the case of organismic development, they evolve into increasingly complex systems. This process involves negative entropy or "negentropy" (see Schrödinger, 1945).

All living systems stand in defiance against the second law of thermodynamics. However, these living systems cannot be perfectly isolated. Never in a state of static equilibrium, they constantly "open" up to their outside world and realize an incessant exchange of material and energy with it. "Open" systems demand consideration not of permanence but of change, not of equilibrium but of a tendency toward disequilibria. They proceed in the direction of ever-increasing levels of complexity, heterogeneity, and organization rather than toward the simplest, most probable state.[12] The epistemology of "open" systems does not merely entail maintenance of levels of relative simplicity (a movement toward entropy). Rather, the notion of openness allows for the possibility of restructuration and re-elaboration of higher, more complex systems (a movement toward negentropy).

In this sense and with respect to the present concerns, it can be stated that the conceptual schemata we use to construct/perceive texts constantly undergo change, and we bring about this change as a result of tension, of perturbations on our customary modes of thought and expression. Change in our conceptual schemata and in our construction/perception of texts stems not merely from a successive formation of simpler less resilient modes of thought, expression, and perception. It also represents, as I will argue, a progressive complexification of our internalized view of the world which is in constant interaction with the external environment: an ongoing process.

There are, then, two fundamentally different processes: (a) the principle of increasing simplicity, symmetry, regularity, structure, and (b) the principle of increasing organizational complexity. The first process can be termed *homeostatic:* the tendency from within a closed system toward a static form of equilibrium (Ashby, 1960). The second can be called *morphogenetic:* perpetual elaboration of new structures by means of breachment of old ones, and a continuous state of disequilibria (Maruyama, 1963). The first process is,

as I have defined it, by an large entropic: toward and increasingly probabilistic state of affairs. The second process is negentropic: against the current. At the lower level of all systems structured simplicity is preponderant, at the upper level organizational complexity increases.

Hence, the construction/perception of textual variability cannot be accounted for solely by means of an epistemology of static, closed systems of interlocking linguistic categories. Texts consist of an ebb and flow of concepts, intuitions, and even emotions which can be adequately accounted for only with a model which entails a set of complementary tendencies: structural simplicity and organizational complexity, stasis and dynamism, equilibria and disequilibria, closure and openness, homeostasis and morphogenesis.

The above leads me to belive that an adequate model of text construction/perception must be in general commensurate with Peirce's epistemology. In brief, Peirce tells us that all signs refer to other signs which refer to still other signs, *ad infinitum.* There are no unmediated signs (Peirce, 1960, 1.339). Furthermore, all thinking is necessarily with signs (Peirce, 1960, 5.253 & 6.338). In fact, thoughts themselves are signs. It follows, then, that all thoughts refer to other thoughts. There exists, therefore, no set of primitive concepts, of axiomatic simples; on the contrary, all knowledge, like signs, is mediated by prior knowledge.

The subject who generates and perceives signs is not, and cannot be, a detached observer, but always a participant *in* the universe of signs: the mind *is* a sign and man *is* the thought. Consequently, "men and words reciprocally educate each other; each increase of man's information involves and is involved by, a corresponding increase of a word's information" (Peirce, 1960, 5.313). Knowledge, in this sense, is self-corrective. Like a cybernetic system of constant feedback, the Peircean system of knowledge continues to change and continues to improve. As it changes it comes nearer to the "truth," but given human fallibility, the "truth" can never be grasped in its totality (Peirce, 1960, 1.180).

The model of texts to be constructed here, in accord with Peircean semiotic, includes language systems as a subset. It entails the notion of an ongoing interaction between man, his thoughts, and the empirical signs he uses.

0.14 The four parts of this study are organized as follows. Each part is divided into *sections* and these sections into *subsections* generally headed by rubrics which state the nature of the subsequent material. The parts, sections and subsections will follow a numerical code. For example, 2.42 indicates that the reader is at Part 2, section four, and subsection two. In addition, I have specified and enumerated throughout the text a series of

DEFINITIONS and PROPOSITIONS which have direct bearing on the model I am in the process of constructing. Please keep in mind that I do not intend, and indeed I cannot hope to pretend at this time, to be able to "prove" these DEFINITIONS and PROPOSITIONS in any absolute sense. They are meant to be reference points about which my argument revolves. You, the reader, by means of your own intuitive capacity, will be responsible for deciding ultimately whether or not they are valid. It is my hope that, by using this organizational procedure, I may be able to render relatively intelligible the diverse range of concepts I attempt to synthesize.

Notes

1. For example, Levi-Strauss, 1967; Greimas, 1966b, 1970; Lacan, 1966; Barthes, 1966, 1970.
2. For some of my earlier work along these lines, see Merrell, 1975, 1976b, 1978a, 1978c, 1979a, 1979b, 1980a, 1980b.
3. See, from diverse perspectives, Ellis, 1974; Hawkes, 1977; Hendricks, 1974; Lotman, 1972; Pettit, 1975; Youngren, 1972.
4. For early examples, see van Dijk, 1972; Ihwe, 1972; Petofi, 1972.
5. See Schegloff, 1972; Schegloff & Sachs, 1973; Sachs, Schegloff & Jefferson, 1974.
6. See Hintikka, Maravcsik, & Suppes, eds. 1973; Lakoff, 1970; Petofi, 1975, Petofi & Reiser, eds. 1973.
7. It bears mentioning that I am not interested, with respect to the theory I will construct, in Wittgenstein's argument against private language, his supposed leanings toward "logical behaviorism," or his operationalism or nominalism. As will become evident below, language use is defined as the generation, within linguistic contexts and social situations, of sentences the nature of which is chiefly determined by culture-bound and *Weltanschauung*-bound conventions. Creative language use beyond these bounds pertains to the "symbol systems" referred to in section 1.0. Hence in the broadest sense language use in texts belongs to the domain of pragmatics: a dynamic interaction between one's general world-view and the syntactico-semantic dimensions of one's natural language (see Schmidt, 1977).
8. This is precisely the way Katz, 1966, 1971, and Chomsky, 1968, compare Chomskyan linguistics to Wittgensteinian language philosophy.
9. Admittedly, the same can be said of "speech acts." The difference between "speech acts" and texts, however, is crucial – see footnote 1, Part 2.
10. To attempt to establish their equivalence is to commit what I have called elsewhere a "Lilliputian fallacy "(Merrell, 1975).
11. For further discussion see Arnheim, 1971; Wiener, 1954; Ashby, 1956.
12. See, for example, Buckley, 1967; Ashby, 1962; von Bertalanffy, 1968; Laszlo, 1972.

PART 1

"Symbol Systems" in Texts

Every language and every well-knit technical sublanguage incorporates certain points of view and certain patterned resistances to widely divergent points of view.

B. L. Whorf (1956, 247)

The objective of the first part of this study is to demonstrate how natural languages and the "symbol systems" in texts pertain to distinct levels of organizational complexity; hence they are not properly reducible to the same analytical procedures.

1.0 Preliminary Statements

Three basic assumptions underlie the model constructed below:

(a) Text systems consist of sets of written sequences generated by means of specialized scientific, literary, philosophical, mythical, religious, etc. "languages" (or "sublanguages" as I will heretofore call them).[1]

(b) The "sublanguages" used to generate text systems entail underlying sets of tacitly presupposed premises which are determined by a particular perspective of all or part of the world.

(c) The premises implicit in all "sublanguages" by means of which texts are written are derived from, to a greater or lesser degree, "symbolic" (that is, "fictional") constructs.

Assumption (c) leads me to an inquiry into what I call "symbol systems." A "symbol system," in brief, consists of a set of graphic signs organized in a written text for the purpose of revealing, describing, explaining, interpreting, or arguing over some aspect of the external world or of an inner world. These "symbol systems," drawn from a particular "sublanguage" or from a combination of "sublanguages" (i.e., Romantic poetry, Realist prose, Newtonian physics, Einsteinian relativity, etc.), are not capable of *saying* directly what the world *is*. At the most fundamental level they are only

capable of *saying* what the world *is like* by figurative uses of language. Hence part of the signs in all "symbol systems" are appropriately defined as, at an explicit or implicit level, fictional constructs. Such fictional constructs include literary fabrications, scientific and philosophical models, religious and mythical creations, mathematical inventions, and so on. Moreover, as I will argue below, the particular "symbol system" underlying a text system constitutes a subset of the total set of possible signs from a given "sublanguage."

"Symbol systems," generated from their respective "sublanguages," are constructed/perceived by means of "conceptual frameworks." One's conceptual framework by an large determines how one sees the world; that is, it compels one to organize one's items of experience into a particular set of pigeon-holes. However, although one's conceptual framework is necessary for organizing one's items of experience, the items actually selected are ultimately determined, like that conceptual framework, by culture-bound, *Weltanschauung*-bound, and language-bound conventions. In this light and in view of the above assumption, I will, during the course of this study, attempt to validate the following hypothesis: A *cognitive mechanism* governs the development of one's conceptual framework, and hence of one's construction/perception of all culture-bound, *Weltanschauung*-bound, and language-bound "symbol systems" in texts.

In view of the centraility of conceptual frameworks in my hypothesis it bears mentioning that this study cannot properly be defined as *pure semiotic* – inquiry concerning the acquisition of conceptual frameworks and the capacity to construct/perceive "symbol systems" – nor *descriptive semiotic* – the analysis of "symbol systems" in actual texts. The first enterprise holds little promise for those interested in actual texts, the second is not adequate for explaining how "symbol systems" are constructed/perceived in all texts at all times. My task is mediate: what writers and readers do when, from within their conceptual frameworks, they create and understand "symbol systems" in texts. This might be called *cognitive semiotic.*

1.1 How do "Symbol Systems" Differ from Natural Languages?

1.10 An adequate definition of "symbol systems" can be forthcoming only after having established the proper framework. In order to establish this framework I first outline a crucial distinction between ordinary lexical items from natural languages and "symbol systems" (i.e., individual units of "symbolic" signification).[2] Then in 1.2 I propose what I believe to be the principle signifying characteristics of "symbol system" entities. And in the

remainder of Part 1 I attempt to demonstrate how "symbol systems" are related to the general culture-bound, *Weltanschauung*-bound, and language-bound conceptual frameworks possessed by all human beings.

1.11 *The construction/perception of "symbol system" entities in written texts involves a "secondary modelling system."*[3] Consider the following sentence strings:

(1) A cigar is a cigar.
(2) A cigar is to smoke.
(3) A cigar is a phallus.

(1) is redundant, tautological. The only information provided is the name of an object generally familiar to readers from Western-World cultures. (2), on the other hand, partly defines the object by describing its function. *Naming* and *describing* do not stand at the same level, for naming "is a preparation for description" (Wittgenstein, 1953, 24e). Mere naming assumes an original connection between word and thing. Description requires a dictionary, a linguistic universe which is autonomous with respect to the thing described but which is itself also supposed to be a vast tautology of circular definitions. In this sense, naming is *extensional* while description involves word definitions which exist in the "dictionary of the mind" and which are *intensionally* related directly to one's internalized conceptual framework.

However, what if instead of (1) I had written:

(1a) A stogie is a cigar.

It appears that I have in this case described nothing. I have merely equated one noun with another, for a "stogie" is a *type* of "cigar." Moreover, it might appear that the relation between "stogie" and "cigar" is similar to that between "unmarried male" and "bachelor," for an "unmarried male" is a *type* of "bachelor" like a "stogie" is a *type* of "cigar" (cf. Katz & Fodor, 1963). However, the problem is that "stogie," and even "bachelor," are not necessarily used synonymously with "cigar" and "unmarried male" respectively. That is, "stogie," in reality, is capable of taking on a particular meaning which "cigar" would not ordinarily possess. As a consequence, "stogie" does not invariably denote merely a "cigar," it can become in a way "symbolic" of, say, certain attributes possessed by a particular *type* of cigar and/or cigar user. This "symbolic" property is more than mere naming or description, for "stogie" as a "symbol" can mean something "other than" what "cigar" would ordinarily mean. However, that other meaning is not revealed in "stogie" as a simple lexical item, only in "stogie" as a "symbolic" entity. This "symbolic" meaning, since "stogie" and "cigar" can name the same object, is also necessarily implicit in the pragmatic or imagined situation: who is smoking the stogie, how he behaves, where he is, etc. In this and similar cases the mode of expression determines the degree of "symbolization."

On the other hand, (3), unlike (1a), reveals directly the "imagined object" for which a cigar can be "symbolic." That is, the relation between "cigar" and "phallus" involves precisely the distinction between ordinary linguistic or literal meaning and "symbolic" meaning. Consequently, the "symbolic" property of (3) is more clear-cut than (1a) since "phallus" ordinarily names something other than a cigar while "stogie" usually names a certain type of cigar. That is, the literal reference of "stogie" is usually the same as the ordinary, and arbitrary, reference of "cigar," while "symbolic" and linguistic reference necessarily differ with respect to "phallus." Hence "phallus," in (3), is "symblic" by virtue of its "other than" reference while "stogie" can be "symbolic" only due to the pragmatic or imagined situation surrounding it.

These distinctions between "phallus," "stogie" and "cigar" are crucial. For instance, strictly on a linguistic level, "bachelor" and "unmarried male" are two different terms which ordinarily, but not necessarily, name the same thing and have the same meaning. Furthermore, to use Frege's example, "evening star" and "morning star" are two terms which can, and generally do, name the same thing, but differ in meaning. In contrast, "stogie" and "cigar" are two different words which can, and generally do, name the same thing, but they can sometimes differ in meaing. When this is indeed the case, one meaning will be literal and linguistic ("cigar") while the other is "symbolic" ("stogie"). On the other hand, "phallus" and "cigar" not only differ in terms of "symbolic" and lingustic meaning but they ordinarily name different things. In this manner, the lexical item ("cigar") and the "symbolic" entity ("phallus") exist at two completely different levels of signification. In other words, even though "cigar," "phallus" and "stogie" might conceivably refer extensionally to the same object, the intensional reference of the two "symbols" necessarily includes something other than the ordinary intensional reference of the lexical item naming the external object. Hence, on the linguistic level, naming is commonly extensional while describing is derived from the "dictionary of the mind" which consists of a set of intensional relations within one's conceptual framework. In contrast, "symbolizing" is wholly intensional. "Symbols" are derived from names in the "mental dictionary" and they are properly described at yet another "deeper" intensional level. Just as the extensional naming of an object prepares ground for its description, so intensional identification and description are preparatory to "symbolization" and reference to imagined objects which are to be "symbolized."

This notion implies, in addition to language systems, the existence of complementary "symbol systems." "Symbol systems" are second order svstems which exist at a level distinct from that of the set of all linguistic

statements. They follow closely what Lotman and other Russian semioticians call "secondary modelling systems" (see Shukman, 1977; Lotman, 1977). In this light:

DEFINITION 1-I: A "symbol system" entity is a fictional construct which refers intensionally to something which is, to a greater or lesser degree, imaginary and other than what it would ordinarily refer to were it a lexical item meant for reference in a literal sense.

And,

DEFINITION 1-II: At the level of "symbol system" signification there exists a set of rules prescribing how lexical items are transformed into "symbolic" entities.

In other words, lexical items which have become part of the "symbol system" in a written text have been transformed from literal and potentially extensional to figurative and intensional, according to DEFINITION 1-I. Proper construction/perception of these items at the "symbol system" level entails construction/perception of variability or change (i.e., novel images, concepts, meanings, etc.). And this activity requires a capacity to use the "rules," postulated in DEFINITION 1-II, by means of which lexical items are transformed into "symbol system" entities. Such "rules" must evidently be explicitly formulated in order to develop an adequate theory of text construction/perception.

1.12 *The level of "symbol system" signification implies culturally shared sets of experiences: a form of life of which one is only partly aware.* Without necessarily conceding to Freudian phallocentrism (which I use only for illustration), or to Jungian archetypes, it can nevertheless be stated that we follow certain culturally and psychologically embedded "symbolic" cues nonconsciously. At the same time we are always conscious, to a greater or lesser degree, of other "symbols" and signs, and we are capable of commenting upon them at will. A distinction must be established between these two levels of awareness. Consider for a moment the following sentence strings:

(4) The lion is roaring (literally).
(5) The "lion" is roaring (metaphorically: "That man" = a "lion").
(6) God is three persons and at the same time he is one.
(7) The earth is the center of the universe.

(4) is of course a literal statement, for it can easily be verified empirically; that is, assuming the listener is in the presence of the lion. Moreover, (4) is in

this sense similar to (2) above: "A cigar is to smoke." It can be adequately interpreted by use of the dictionary definitions of all lexical items present.

(5) is obviously syntactically identical to (4). With respect to meaning the two statements differ radically, however, since "lion" in this case is used figuratively, and it is correctly understood as a metaphor for a particular "man": hence it pertains to what I have called above the "secondary modelling system." In this sense, ordinary dictionary meaning is insufficient for decoding and interpreting this statement. A general knowledge of the possible figurative uses of the lexical items in (5), and of the specific contexts in which these particular lexical items can be used, is essential. This entails knowledge of the possible categories of "symbolic" signification and knowledge of culture-world (a topic to be discussed further in 1.3).

Moreover, statement (5) can be contrasted with statement (6) with respect to an additional feature of "symbolization." For instance, let us assume that the speaker and listener(s) of (5) are capable of commenting *about* the nature of "that man" which makes him *like* a "lion." In this case there appears to be nothing anomalous or mysterious about the metaphorical statement. Let us now assume that, for the true believer, (6), like (5), is also "symbolic." And, we might even assume, the utterer is generally aware, from within the religious cosmology in which he exists, of the ritualistic implications of the statement. It constitutes part of the form of life in which he participates. Although from a logical point of view the statement is contradictory, this contradiction is irrelevant from within the religious cosmology; it is usually not ever discussed or thought about. Nor is it imperative that the statement correspond to the utterer's empirical world, for it belongs to the realm of religious belief where anything might be possible, where many concepts require no logical explanation, and where mystery can prevail. It is true simply because it is believed to be true.

However, there is, and there must be, a fundamental distinction between (5) and (6). (5) is ordinarily construed to be merely a metaphor. It is understood publicly, but normally there is no truth value attached to it in a literal sense. A man is a man and a lion is a lion with respect to certain attributes they share (to be further specified in Appendix II). On the other hand, God as a three-in-one being is, let us assume, ordinarily conceived in a figurative sense; yet the statement is necessarily part of a shared, and ritualistic, belief system. At the roots of this belief system lies mystery, but this mystery is not essentially more enigmatic than, say, the utterance that "Sammy Davis Jr. is a square," though we all know better than to, by a leap of faith, take it as true. In this sense, metaphor, at the level of the "secondary modelling system," can entail belief at a root level or not. In whichever case, the mechanism by means of which metaphor is generated is universal (following DEFINITION 1-II).

There is, in addition, a basic distinction between (6) and (7). For the utterer of (7), assuming that she exists in a particular scientific community, there exists no apparent mystery with respect to the statement: she believes that it describes the world literally as it is. As far as she is concerned the statement can be empirically validated from within her scientific conceptual framework and by means of her scientific "sublanguage." And the terms she uses to describe it are defined by means of her "mental" (scientific) dictionary" which is, according to her, self-sufficient and self-confirmatory. On the other hand, the utterer of (6) uses words which refer not necessarily to any empirical reality but to a set of "axioms" for which there is no ultimate proof. He might willingly admit that there is no immediate empirical evidence for the "axioms," but he accepts them anyway on faith. That is why they remain a mystery, and if the mystery were to be removed his religion would no longer be, at least for him, properly a religion, but part of a set of presumably empirical statements, like statement (7) (see, for diverse views, Barbour, 1966; Braithwaite, 1955; van Buren, 1972; MacCormac, 1976; Ramsey, 1957; Sperber, 1975).

Yet ultimately the utterer of (7) can be, though ordinarily unaware of the fact, also inside a cosmology whose set of statements about the world is self-contained. In this case her ontological status is like that of the utterer of (6), but she is at a distinct disadvantage; she does not know that she believes on faith, she blindly and faithfully believes that she knows (see Capek, 1961; Feyerabend, 1975; Turbayne, 1962; Whitehead, 1948).

Lack of awareness of what one believes or knows severely restricts one's ability to explain that belief or knowledge. On the other side of the coin, consciousness of one's belief and knowledge implies that such belief and knowledge can, with relative effectiveness, be explained. But since, from a historical perspective, all beliefs, all dogmas, and all scientific theories have been to a greater or lesser degree erroneous, we must admit that belief and knowledge are part of an ongoing process of cognition. And this is so, for they are ultimately culture-bound, *Weltanschauung*-bound, and language-bound (to be discussed further in Part 2). Moreover, the becoming of awareness incessantly alters, to a greater or lesser degree, our belief and knowledge systems. When we become aware of new information, we can either adopt it or reject it, and it can either change, slightly or radically, our belief and knowledge system or not. Also, what we now know, we can forget to the extent that our actions reveal that we know it even though we are no longer consciously aware *that* we know it (Polanyi, 1958). On the other hand, we can, on occasion, become once again conscious of what we forgot such that we now know *that* we knew. And so on.

A "thought experiment" may bear me out. Assume, for a moment that in

a particular cultural milieu Freudian "symbology" is believed to be true. Assume also that:

(3) A cigar is a phallus.

is "thought" at a nonconscious level by a person who has never heard of Freud (i.e., he once overheard the statement and he is now "thinking" it without being aware of its implications), and he behaves according to Freudian imperatives. He is in this case unaware of the "symbolism" in his thoughts and his actions, yet let us suppose that he continues nonconsicously to think and act *as if* he knew. One day someone tells him: "You are behaving like a Freudian misfit." He inquires about Freud and, to his satisfaction, receives ample explanation. Now, let us suppose, he is capable of uttering:

(3a) A cigar is a "phallus."

with awareness of what the equation between "cigar" and "phallus" implies – hence phallus was placed in quotation marks. Moreover, (3a) is now at least partly explainable for him whereas (3) was not; what was once "ineffable" is now part of his relatively explicit view of the world. What he once knew without knowing he knew, he now thinks he knows *that* he knows. Since "cigar = phallus" now constitutes part of his conscious "symbolic" knowledge, an ordinary cigar will now for him cease to exist solely at the first level of signification. That is, it can project out toward "symbolic" meaning at the level of the "secondary modelling system."

In sum, the hypothetical "thinker" of (3) acted *as if* he knew about the "symbolic" implications of his "thoughts" even though he did not consciously know *that* he knew, whereas the supposed utterer of (6) above is aware of the 'symbol" he uses, though he cannot adequately explain it. On the other hand, the utterer of (3a), having now been properly versed in phallocentric jargon, believes he possesses sufficient knowledge about his "symbolic" statement such that he can adequately explain it, while the utterer of (7) believes she literally describes the world as it is without necessarily being aware that she makes her statement from within a culture-bound, *Weltanschauung*-bound, and language-bound and partly "symbolic" framework.

Hence, to conclude tentatively at this point: (a) one's statements may be perceived "symbolically" in a particular context even though one is not conscious of the "symbolism" one uses, (b) one's statements may, in a ritualistic sense, be used "symbolically" with awareness that they are so used, but since they are linked to a belief system, they are assumed to pertain to deeper "truths" which are in whole or in part nonexplainable, (c) one's statements may be used as literally and empirically pertaining to the world, though one is unaware that the underlying presuppositions making possible

the generation of those statements are linked to a belief system which may rest on a "symbolic" base, and (d) one may use statements with awareness of their "symbolic" base; in this case they are construed at a consicious level as fictions, or as scientific models with which to describe an aspect of the world (see, for example, Hesse, 1966; Vaihinger, 1924).

1.13 *A typology of "symbol system" statements.* In light of the tentative conclusions in the preceding subsection, I propose the following definitions of any and all figurative statements generated by means of "symbol systems":

DEFINITION 1-III: *Symbolic* statements (i.e., statements with figurative meaning) are partly nonexplainable whether the utterer is aware of the *symbolic* implications of the statement (such as statement [6] or conclusion [b]) or not (such as, under certain conditions, statement [3] or conclusion [a]). These statements may pertain to proper ritualistic, mythical, religious, etc. *symbol systems* in the public sense, or to dream-world, hallucinatory, mystical, poetic, intuitive, etc. *symbol systems* in the private sense.

DEFINITION 1-IV: The utterer of figurative statements may be confident that he or she can adequately explain his or her statements whether he or she is aware that they are embedded in a particular world-view (such as, under certain conditions, [3a] or conclusion [d]) or not (such as [6] or conclusion [c]). These statements pertain to *semion systems. Semion systems,* like *symbol systems,* can be public or private.

DEFINITION 1-V: *Symbol systems* and *semion systems* are mutually exclusive: what for one person is *symbolic* might be for another *semioic* (such as the [3]/[3a] or [a]/[d] distinctions). But a signifying entity cannot be both *symbolic* and *semionic* at the same moment and from the same perspective (to be discussed further in Part 3).

DEFINITION 1-Va: Individual *symbolic* entities will be called *symbols. Semionic* entities will called *semions* (not to be confused with *semeions* which is the Greek word for signs).

DEFINITION 1-VI: *Semion systems* and *symbol systems,* which pertain to the general category of all "symbolic" (that is, figurative) statements, are subsets of the larger *semiotic system* (compare to Piaget, 1962, on the semiotic of play).

In the subsections that follow I discuss key aspects of these definitions.

1.14 *Examples of the distinction between explainable and nonexplainable "symbol system" constructs.* Consider the following:

(8) A physicist can solve the problem.
(9) God will provide a way.
(10) The universe is (like) a machine.
(11) God is our father.

Statements (8) and (10) might pertain to lexical items generated from a particular scientific "sublanguage" and by means of a conceptual framework. Statements (9) and (11), on the other hand, might belong to a religious "sublanguage" used within a particular sacred cosmology. (8) and (9) might be construed as literal statements, yet they are in a way *symbolic.* In contrast, (10) and (11) are strictly *semionic.* Let me give more details.

The utterer of (8) certainly believes, from within his general conceptual framework, that his statement refers to the "real" world. Assuming that the statement came from, say, a biochemist, there is also inevitably a degree of "faith" and perhaps even "mystery" implied by the statement. The utterer does not know how the physicist will solve the problem but he believes that he is capable of so doing. Similarly, faith is also ordinarily revealed by statement (9); the main difference is that the implications of (8) are limited to belief about the way problems are resolved in the physical world, while (9) implies belief in the intercession of an extra-terrestrial and presumably nonempirical being to resolve issues in the world. Yet both statements are analogous in so far as they are meant to refer to literal events presumably brought about by beings (terrestrial or extra-terrestrial) which are believed to have capabilities not possessed by the utterer.

Furthermore, belief makes the statements not-so-literal as desired since the element of nonexplainability with respect to a "physicist" and "God" tends to *symbolize* them.[4] However, this level of *symbolization* is not ordinarily conceived/perceived as *symbolization* at all. Like "stogie" in statement (1a), "physicist" and "God" in (8) and (9) are not ordinarily conceived/perceived as naming something other than what the lexical entities are ordinarily designed to name. "Physicist" and "God" are in this sense properly embedded in the utterer's form of life such that they are for him part of a statement which can potentially become real. Yet (9), when used in the same context and in the same text with a statement such as (11), necessarily takes on meaning which is equally *symbolic*, although ordinarily at a tacit level. "Father" in (11) relates to "God" in both (11) and (9) to saturate the statements with *symbolic* implications. That is, in the Peircean sense, committment to a discourse of signs is committment to a view of the world, for all signs are related to all other signs. Hence if one sign in a system is *symbolic* it is not properly intelligible outside all other signs in the system, and this interrelatedness tends to *symbolize,* to a greater or lesser degree, the entire system (this phenomenon will be formalized in Part 4).

(10), in contrast, is clearly a figurative statement. The universe is obviously not really a machine, it is "like" a machine. By juxtaposing the universe, a relatively unknown entity, with a machine, the working parts with which we are somewhat familiar, the unintelligible is made at least partially intelligible

and explainable by means of metaphor. That is, the universe, an abstract part of which is not available to empirical observation, is related to an observable object, and the abstract entity in this *semionic* statement becomes relatively explainable by its metaphorical relation to the concrete entity.

However, a shift from a *semionic* statement to what is believed to be a literal statement is also possible. (10), presumably *semionic* in the beginning, embodies the Newtonian-Cartesian mechanical model of the universe which has, as it seems, been at times construed as literally true. That is, it has become embedded in a general scientific cosmology (cf. conclusion [c] in 1.12). In this sense the parenthetical portion of (10) becomes suppressed and the universe is now looked upon as if it were in reality a machine, even though the metaphorical equation is no longer explicitly stated as such. Consequently, in this case the use of the term "universe," like the embedded everyday use of "stogie," has become *symbolized:* tacitly construed as if it were literal, but in reality *symbolic* since the user is no longer immediately and explicitly aware of the *symbolic* implications of some of the terms he or she uses. Such metaphorical statements like (10) which are perceived as literal statements within a broad-based scientific world-view constitute what might be called cosmological "category mistakes" (Turbayne, 1962).

In a similar way (11) can be for one particular user literal, while for another user within another religious paradigm it might be *semionic,* a metaphorical statement. In this latter sense, the statement is properly meaningful because the relationship between earthly fathers and their children is known by empirical observation, and hence an analogous relationship between God and mankind is made intelligible since it is connected to an implied assertion which is known in a concrete sense to be "real." By extension, (9) is an abstraction which could also be rendered less abstract, *semionic,* and more adequately explainable like (11) by stating: "God will provide a way 'like' the shepherd leading his sheep to water." That is, metaphorical concretion has tended to *semionize* (9).

In sum, then, statements (8) and (10) pertain, at least for a particular utterer, to the "real" world and to scientific cosmologies, and statements (9) and (11) pertain to religious cosmologies and otherworldliness. Nevertheless, to reiterate, (8) and (9) tend to be, according to DEFINITION 1-III, part of a set of *symbolic* statements. On the other hand, according to DEFINITION 1-IV, (10) and (11) are generally overtly *semionic.* Hence, (8) and (9) necessarily involve, to a greater or lesser degree, mystery and the ineffable. In contrast, the utterer is ordinarily able to speak relatively effectively *about* (10) and (11). Yet the implication of these statements may become embedded in his or her consciousness such that they tend to become for him or her literal rather than *semionic.* In this sense they have

become in reality *symbolic,* according to DEFINITION 1-III, in so far as the utterer is no longer aware *of* the *symbolic* implications of his or her utterance (for more discussion on this notion of embedment see Merrell, 1982).

Only in the way described above can the dynamic relationship between *semions* and *symbols* as put forth in DEFINITION 1-VI be accounted for.

1.15 *An example of diverse perspectives determining whether* semionicity *or* symbolicity *is the case.* Consider this statement:

(12) The moon is a platinum spider that spins its web as it moves across the the sky.

If found in a mythical text it could quite conceivably be constructed as literally true and at the same time metaphorically valid, like (11) for the Christian. If placed in a "discursive" text (i.e., scientific, logical, philosophical) it would undoubtedly be looked upon as sheer nonsense. In a poetic text, on the other hand, it takes on a range of potential metaphorical meanings which can be coherent within the context of the poem, valid with respect to aesthetic criteria, and functional regarding human artistic intelligibility. Expectatations by and large determine how a text is perceived and context determines whether an individual statement is construed to be true, false, nonsensical, or meaningless, or, whether it is construed to be literal, *semionic,* or *symbolic.*

However, it is impossible to distinguish, for any given writer or reader, those textual signs which are constructed/perceived as literal, *semionic* or *symbolic,* and those signs which are so constructed/perceived with awareness or nonconsciousness. The actual writer is unaware of the figurative implications of some of what she places in the text, and the reader, though we will suppose he is aware of most of what he interprets from the text, is inexorably limited to no more than a partial reading: his interpretation is always incomplete (to be discussed further in Part 2).

It might be assumed at this point that we could postulate the existence of an ideal writer capable of generating an infinite text, all aspects of which he is conscious, and an ideal Super-reader capable consciously of perceiving the text from all angles simultaneously. Yet for the purpose of the present inquiry such ideals are not epistemologically feasible. They would be similar to the Laplacean ideal. Laplace, it will be recalled, postulated a Super-intelligence capable of, at a given instant, being aware of the condition of each and every particle in the entire universe, and with such knowledge he would be able to predict all future events. This thinking belongs to an outmoded world-view. Twentieth century science and epistemology admit to the impossibility of instantaneously perceiving all aspects of a given domain. By extension, no writer, ideal or otherwise, can be conscious of the *semionic*

and *symbolic* implications of all he writes, and no reader can simultaneously perceive all possible aspects of a text. Each and every human perspective is to a greater or lesser degree incomplete, finite.

Certainly, then, a model for the generation/perception of textual *symbol* and *semion systems* is definitely beyond our grasp if some instantaneous and infinite consciousness is proposed. What I believe can be formalized is: *a mechanism for generating/perceiving texts at alternate levels of awareness.* In this sense the proper *semion* and *symbol* construct cannot determinately be perceived by a given reader, though a degree of "overlap" obviously determines effectiveness of communication. And, *semion* and *symbol* constructs perceived by defferent readers will vary, though the set of "shared cultural experiences" by and large determine the collective receptivity of the text.

1.16 *Some examples from texts.*

First, consider some lines from Henry Vaughan's "The World":

I saw Eternity the other night
Like a great ring of pure and endless light,
All calm, as it *was* bright;
And round beneath it, Time is hours, days, years,
Driven by the spheres,

Commenting on these lines, Levin (1977, 133-34) tells us that they "describe an astounding vision: eternity, normally regarded as a dimension or aspect of time (leaving aside its theological implications), is seen as physical and concrete, in spatial terms." In other words, the poet has created, as a poetic domain, an imaginary world in which he invites the reader momentarily to exist. This imaginary world is itself a vast metaphor, an underlying "macrosemantic symbol" as part of the text's "symbol system," by means of which the poem is constructed.

This "vast metaphor" I speak of constitutes an underlying vision of the world. It is supported by, and indeed it is the embodiment of, the set of surface metaphors, similes, and other figurative devices in the text. Eternity is "like a great ring of pure and endless light," and time is "like a vast shadow moved." Both similes combine to support the deeper, all-encompassing poetic vision. If the reader is properly aware of this "macrosemantic" level, as in conclusion (d) above, the underlying metaphor and all its surface manifestations may be construed properly as poetic, rhetorical or ornamental devices (at the *semionic* level). Or, if the reader is aware in the sense of conclusion (b), the metaphor may point toward an imaginary world which is part of a shared ritual, a communal experience (i.e., religious poetry at the *symbolic* level). On the other hand, if the reader is not aware, as in conclusion

(a), of the underlying "macrosemantic" level of the text, she may yet comprehend it at an implicit level, sensing its significance with respect to herself and/or her world (in the strict *symbolic* sense),

Now let us turn our attention to prose fiction, namely, a passage from Borges' "The Garden of Forking Paths":

> *The Garden of Forking Paths* is an incomplete, but not false, image of the universe as Ts'ui Pen conceived it. In contrast to Newton and Schopenhauer, your ancestor did not believe in a uniform, absolute time. He believed in an infinite series of times, in a growing, dizzying net of divergent, convergent and parallel times. This network of times which approached one another, forked, broke off, or were unaware of one another, for centuries, embraces *all* possibilities of time. We do not exist in the majority of these times; in some you exist, and not I; in others I, and not you; in others, both of us. In the present one, which a favorable fate has granted me, you have arrived at my house; in another, while crossing the garden, you found me dead; in still another, I utter these same words, but I am a mistake, a ghost (Borges, 1964, 28).

This is, in a very fundamental aspect, the narrative equivalent to the lines from Vaughan's poem, for "most of Borges' fiction is neither character nor plot, considered in the traditional sense; but, instead, as in science fiction, a proposition, an idea, a metaphor, which, because of its ingenious or fantastic quality, is perhaps best called a conceit" (Christ, 1969, 15). Borges' matter-of-fact style, if perceived *semionically* according to conclusion (d), is a mere fiction to be contemplated intellectually, and, like metaphysical poetry, its evocation of emotional response is minimized. This, truly, is fiction good to "think with." Uncommitted socially, free from material needs and desires, devoid of immediate concerns, it lends itself to relatively detached contemplation, like a mathematical proof, or a scientifically accepted view of the world.

Speaking of science, consider the following lines from Everett's rather controversial "many-worlds interpretaton of quantum mechanics":

> A physical system is described completely by a state function ψ, which is an element of a Hilbert space, and which furthermore gives information only concerning the probabilities of the results of various observations which can be made on the system. The state function ψ is thought of as objectively characterizing the physical system, i.e., at all times an isolated system is thought of as possessing a state function, independently of our state of knowledge of it (DeWitt & Graham, 1973).

Everett is here speaking of an isolated system, a world, or The World,

whichever the case may be, which is conceived *as* the objective characterization of The Physical System by means of his postulated "state function" (keep in mind that the structure of Everett's argument is our focus of attention, comprehension of the formal language is not necessary).[5] The "state function" is a (metaphorical) axiomatic base, a fiction, for describing the "real world." It is, we would suppose, an intentionally constructed fiction. In this sense, the positivist might want empirical evidence that the fiction can be validated (as a *semion* in the sense of conclusion [d]) (see Vaihinger, 1924). But this is problematical with respect to modern physics, for obvious reasons, since the quantum level of the physical world is not, and most likely cannot be, directly observable. True, it is a fictional construct (in accord with conclusion [d]), yet it can become embedded in the conceptual framework, and hence in the nonconscious mental activity, of one's though (as in conclusion [c]), to become conceived and perceived as the one and only True World (in the *symbolic* sense) (for additional discussion along these lines see Merrell, 1979d).

It often happens that knowledge, assumed to be true with respect to the world, turns out to be in reality embedded culture-world knowledge. For instance, Plato's slave-boy in *Mena* was supposedly capable of knowing by some "inborn capacity" the fundamental axioms of Euclidean geometry. And the "correct" rules of logic, which people presumably knew and had been using tacitly for centuries, were explicitly formulated by Aristotle. However, such "unconscious" knowledge which is purportedly open to introspection does not always prove to be absolutely and eternally reliable. The geometry Plato used is no longer considered valid for all situations, and Aristotelian logic is now criticized in some quarters. Recall Kant who assumed that *a priori* conditions of cognition were based on a conception of time, space, and causality which followed the Newtonian world-view. He was in error. Recently the scientific community is dangerously close to accepting "on faith" the principles of the Copenhagen interpretation of quantum mechanics. Perhaps they too are in error (Bohm, 1951). The problem with Kant of course was that his "knowledge" was in reality that of a culture-bound universe of propositions – in this case Newtonian scientific propositions – which corresponded to "embedded" knowledge. What appear to be the most obvious truths may in essence constitute deeply embedded culture-bound knowledge. In a world inhabited by people who wear blue goggles it is axiomatic that everything is tinged with blueness.

Interestingly enough, I might add that DeWitt and Graham's (1973) edition containing Everett's original interpretation of quantum mechanics and other pertinent papers is introduced by an epigraph, the above Borgesian quote, which, in a very real sense encapsulates this highly sophisticated and

rigorously formalized scientific perspective of reality!

It follows, in this light, that:

1.17 *No absolute boundary can be established for separating* symbolic *from* semionic *statements.* Yet a statement cannot be simultaneously both *semionic* and *symbolic*; it can either be one or the other depending on varying perspectives. And, to reiterate, neither is there ultimately an absolute criteria for determining conscious and nonconscious use or explainability and nonexplainability of *semions* and *symbols.* Different perspectives yield different classes of statements. To be more precise:

PROPOSITION I: The cognitive mechanism for constructing (creating) or perceiving (re-creating) meaningful and unique *semion* and *symbol* systems is the same for all human beings irrespective of consciousness or nonconsciousness and or explainability or nonexplainability.

PROPOSITION II: An absolute boundary need not be established between *semions* and *symbols* when constructing a model of the cognitive mechanism put forth in PROPOSITION I. (Therefore, for brevity, *semion-symbol systems* will henceforth be referred to by the term SS-systems and they will be properly distinguished when necessary.)

1.2 *Semions* and *Symbols:* From a Semiotic Point of View

1.20 Let us now take a new direction, with the task of: (a) describing the specific characteristics of *semion-symbol* signification, and (b) locating SS-systems in the general semiotic framework.

1.21 Semions *and* symbols *are not directly connected to referents in the world.* Consider Figure 1 (following page), a quaternary model of the *semion* and *symbol.* IMAGE and CONCEPT are the counterpart of Saussure's signifier and signified, and SEMION-SYMBOL is the composite of concept and image in much the same way as signifier and signified combine to make up the linguistic sign. Continuous lines represent *direct intrinsic* (*intensional*) *linkage* and broken lines depict *indirect extrinsic* (*extensional*) *linkage.* Direct linkage is interdependent, analogous to two sides of a sheet of paper as Saussure's signifier and signified.

Indirect linkage, as with the case of Saussurean linguistics, is always *arbitrary* in the beginning. That is, there is no absolute nor necessary relation between the mental sense-image, the concept, or the *semion-symbol*, and the physical referent in the "real" world. The only constraints for indirect

in a given culture-world and to the limitations of a subject's knowledge of his particular culture-world. Indirect linkage in the arbitrary sense is used with cognizance of the "as if" quality between the object, act, or event and the figurative use of the *semion-symbol.*

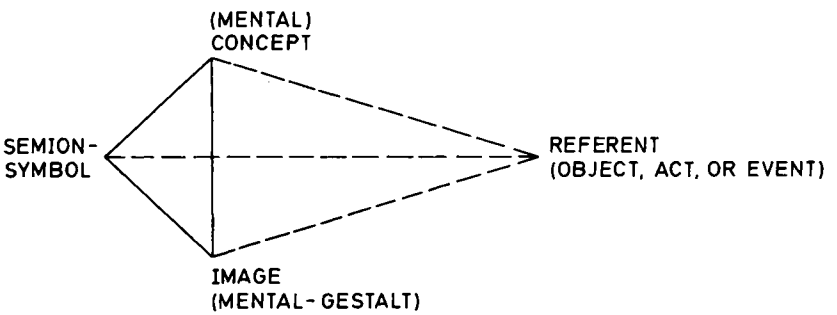


Figure 1

Unlike Ogden and Richard's model, I establish no direct connection between concept-image and external referent.[6] Since, according to my conception, the SS-system is determined to a large degree by an individual's conceptual framework, there is no direct relation between the SS-system and that world of objects, acts, and events. Direct union exists between (mental) image, concept (or thought), and the *semion-symbol* which is representative not of something "real" but of an imagined content. And, this imagined content is necessarily a selective abstraction from "reality" (see also Merrell, 1982).

For instance, in the linguistic sense a cigar is "real." To name the long object being perceived as a "cigar" is to establish a certain direct referentiality between an (arbitrary) sound and a thing. On the other hand, according to the above formulations, "cigar" can also be the *semionic* (or *symbolic*) representation of "phallus." It is in this sense part of the "secondary modelling system." "Cigar-Phallus" does not consequently enjoy direct reference to a "real" object in the world as is the case of the "cigar-thing" relation. Hence "cigar-phallus"-as-*semion-symbol* is not real but imaginary.

1.22 *The relationship between direct and indirect linkage and between private and public use is dynamic. Direct intrinsic linkage* is in the beginning private, the product of an *analogical act* (to be discussed in Part 3). As a result of a figurative connection established between some *freely created semion-symbol* and some imaginary referent, the user can construct a

metaphorical universe of discourse by means of *direct intrinsic linkage* (for the notion of free creation of "symbols" see von Bertalanffy, 1965). A "rose" or "slithy toves" in poetic language, "machine" or "aether" for the scientist, or imaginary "snakes" under the bed for the schizophrenic, all are cases of what is in the beginning arbitrary but meaningful use of *freely created semions* and/or *symbols* with respect to human intellectual, emotional, or sensory imaginary constructs.

However, private in the beginning, by collective use and habit this *direct intrinsic linkage* can become part of public literary, scientific, or other, conventions. As such it now constitutes part of one's shared culture-world knowledge. It can even come to be construed "as if" the *linkage* were *direct* and *extrinsic*. In this sense it is "as if" the SS-system entity literally denotes the "real" thing in the "real" world. For instance, by means of such change in the linkage system, a body of scientific discourse might be perceived as a set of "true" and literal statements about the world even though they originated from metaphorical hypostats (such as has been the case of the Arostotelian "natural order," the Newtonian-Cartesian "machine model," such constructs as "phlogiston," "aether," etc.) (see, for example, Berggren, 1962/63; Brown, 1976; MacCormac, 1976; McCloskey, 1964; Turbayne, 1962).

On the other hand, linkage which was presumed to be *direct-extrinsic* can become *indirect-extrinsic* in the eyes of the perceiver by means of de-embedment. When the scientist discovers that the theory he believed to be true does not actually correspond to the world he observes, when the schizophrenic is "cured," when the reader of a poem suddenly intuits the underlying meaning of a line, etc. all these acts represent a reversal of the process. What was conscious can become embedded and what was embedded can become conscious (compare, with respect to the poetic text, Mukarovsky's, 1964, "foregrounding" and Shklovsky's, 1965, "defamiliarization"; concerning the schizophrenic, Watzlawick, Weakland, & Fisch, 1974; and concerning the general cognitive process, Bruner, 1957, 1963). Hence, *semion-symbol* signification presupposes a dynamic interactive view of SS-system entities which can be specified by the following characteristics (I here reiterate some of the assertions in 0.13):

(a) There is a dual tendency toward ongoing disequilibria and ordered equilibria. Construction/perception of SS-systems is dynamic, open and governed by movement toward higher, more complex forms – this occurs in the process of de-embedment of old SS-system entities and creation of new ones. At the same time "entropy" threatens to produce a relatively static state – when part of the SS-system becomes embedded such that habitual behavior, or pathways of least resistance, become the norm.

(b) SS-systems consist of hierarchical levels of organization, they are not merely a copy of reality. In their construction/perception, interaction exists between the construction/perception process and the outer world. This interaction can entail, as will be illustrated below, dynamic change between *direct-intrinsic* and *indirect-extrinsic linkage,* and between embedded and de-embedded use of *semions* and *symbols.*

(c) There is a continual movement, during construction/perception of SS-systems, toward organizational complexity and differentiation. SS-systems do not correspond precisely to all-or-nothing binary systems. As they become more complex, oppositions are dissolved and others continually formed. Consequently, there must be a move beyond consideration of static, combinatory systems in an effort adequately to describe the generation of SS-systems and other relatively complex code systems.

Let us now turn attention toward SS-system entities with respect to broad-based communicational frameworks.

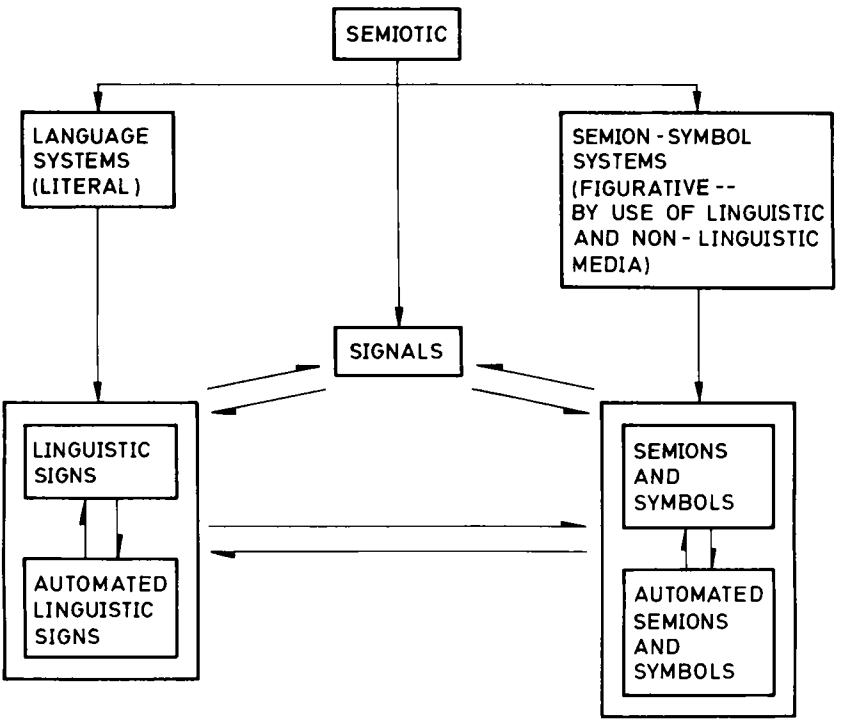
1.23 *Embedded linguistic statements are not the same as* semionic *and* symbolic *statements.* Consider Figure 3 (next page), the construction of which draws from Leach (1976) and Mulder and Hervey (1972). *Signals* are the result of habitual stimulus-response activities. Both human and animal, linguistic and non-linguistic, instinctual and social, they involve a large part of communication although they are only of peripheral interest to this inquiry. They include icons, analogs, cries, gestures, interjections, exclamations, and tactile, olfactory and even gustatory images. Response to signalled messages in this sense are chiefly triggered, automatic and mechanical.

The *language component* entails sets of *linguistic signs* which are, under normal conditions, conceived to be literal and non-figurative statements concerning a particular aspect or state of the world. Linguistic signs are combined to form sets of sentences which directly stand for something to someone in a particular context. *Automated* sets of *linguistic signs* are those which have become embedded. Their use is primarily tacit, and, they tend to follow pathways of least resistance, either public or private. For instance, consider the following strings of automated signs:

(13) "Hi, how are you?"
"Oh, I'm fine, what about you?"
"Yeah."
"Be seein' ya."

These messages constitute language forms whose use has slipped below the level of consciousness: they have become embedded. With respect to such sentence strings viewed strictly from a linguistic perspective, information

content is low and redundancy is maximal (compare to Jakobson's, 1960, phatic communication). However, meaning is certainly existent when the



(where "→" denotes that the preceding domain includes the following domain and "⇌" denotes dynamic interaction between the two domains where the entities are potentially interchangeable one into the other)

Figure 3

context of the utterances is included. That is, in a pragmatic sense the two parties involved might be implicitly telling each other something like this:

(14) "I like you and you like me, . . . I'm O. K. and you're O. K., . . . Perhaps we could talk about a lot of things, but . . . you know what

you know what I mean, don't you? Yeah, we're really communicating, aren't we?"

In contrast, *deautomated* use of language occurs in a private sense when in ordinary speech one utters, knowingly or not, a unique or extraordinary combination of words. Given the potential for generation of an infinite number of sentences in a natural language by finite means, there is an indefinite potential for such utterances in the language component.

Figurative SS-systems have been discussed above. What bears mentioning here, with respect to Figure 3, is that communication by use of conventional SS-systems can be chiefly implicit and at the *automated* level where public use derives from social rules and roles. Communication at this level of SS-system discourse always tends to become habitual: necessary for social survival. And social survival within a given community by means of conventional usage of SS-system entities becomes to a greater or lesser degree imperative. For this reason, modes of speech, intonation patterns, recognition of linguistic cues, and even interpretation of texts at the embedded public level involve deep-seated preconceptions, conventions of truth and falsity, and "common sense" intuitions. Freedom from certain aspects of one's SS-systems, and even of one's conceptual frameworks, can occur only through privately experienced *deautomization* by means of a minor or major *Gestalt "switch," when one becomes* aware of a slightly or radically different perspective (this so-called *Gestalt* "switch" will be discussed in Part 2).

1.3 Why is Knowledge of Culture-World, in Addition to Knowledge of Language, Necessary?

1.31 I now turn to some important preliminary work in the area of linguistic semantics to determine what significance it holds for the model to be constructed here. From within the orthodox branch of Chomskyan linguistics, investigations in semantic representation have been forthcoming for almost two decades. The most widely known model of what has been called interpretive semantics is that of Katz and Fodor (1963). Katz and Fodor specify that the semantic component is composed of a dictionary and projection rules. A dictionary entry will contain one or more *syntactic markers* (part of speech), one or more *semantic markers* (properties), perhaps a *distinguisher* (special qualities), and, optionally, a *selection restriction* (entailing specific applications). On "reading" a lexical item a "path" is chosen and therefore a direction which hopefully will lead to the proper

interpretation. Thus, the meaning for "spider" in "The spider caught the fly" would most likely be:

(15) SPIDER → noun → (nonhuman) → (animate) → (segmented body) → (four pairs of legs) → [having spinnerets for spinning silk to make webs] ⟨ (entangle prey in web) ⟩

(where the parentheses enclose semantic markers, the square brackets distinguishers, and the angular brackets selection restrictions)

In contrast, one possible path for "spider" in sentence (12) might be:

(16) SPIDER → noun → (nonhuman) → (animate) → (segmented body) → (four pairs of legs) → [having spinnerets for spinning silk to make webs] ⟨ (moves across web like the moon across the sky) and (when silver in color [which is not the case in nature], like the moon) ⟩

Obviously, a problem arises with respect to (16). How is the selection restriction to be determined if we are limited to dictionary definitions? Under "spider" the dictionary tells us nothing about moons, nor does it tell us about spider under "moon." It does not mention the existence of "platinum spiders" nor of "webspinning moons." It gives us no analogy between a micro-universe – the web – containing a spider, and our macro-universe containing the moon. Should the *symbolic-semionic* implications of "spider" be simply presupposed on the part of the reader? Perhaps, it could be conjectured, we might attempt to disambiguate "spider," like Katz and Fodor disambiguate "ball" in "This is a colorful ball" (as a social activity) and "This is a colorful ball" (as a globular shaped physical object). This would be problematic, however, for there is no necessary ambiguity in the use of "spider" in (12); figurative interpretation, misinterpretation or confusion, perhaps, but hardly any ambiguity. How adequate, then, is the Katz-Fodor model for SS-system construction/perception?

1.32 *Where* semions *and* symbols *are concerned, dictionary meaning is limited.* "This is a colorful ball" is ambiguous semantically; the problem with "spider" in sentence (16) depends upon (conscious or tacit) knowledge of SS-system categories in addition to dictionary knowledge of language. "Entangles prey" determines precisely, and according to dictionary definitions, the selections restrictions in (15), but "like the moon" in (16) does not. Moreover, "entangles prey" refers directly to "spider" whereas "like the moon" is related to its noun only mediately, through *symbolic signification:* the relation lies outside the dictionary of lexical items. Hence "spider" in (16) is not merely a definable lexical item as is the same term in (15). It belongs to another type of organization, at the level of the "secondary modelling system."

There are other inadequacies of the Katz-Fodor model which are relevant to the present inquiry.

First, the model deals with "atomic concepts" which require the type of componential or "distinctive feature" analysis precisely against which Chomskyan linguists reacted (see Bolinger, 1965; Weinrich, 1972). The most obvious pitfal of atomism, as all Chomskyans should be aware, is that when we look too closely to the parts we cannot see their function within the whole (interestingly enough McCawley, 1968, hedges on the point that Chomsky's selection restrictions are semantic anyway and therefore can, and sometimes do, rely on nonlinguistic information).

Second, Eco (1976) criticizes Katz and Fodor's disregard for connotations and their refusal properly to consider settings. The model "fails to take into account an infinity of possible ramifications (or paths)." Bunny, rabbit, and hare might possibly pertain to the same "physical object" even though the distinguishers and selection restrictions governing the use of the words are at variance. Which of the three lexical items is to be used in a particular situation? Choice depends on whether we are using literate language, speaking of hunting, raising or eating the animal in question, or speaking to a child. Or what if we are referring to a *Playboy* centerfold? The number of situations is potentially unlimited. In reality, the speaker must possess, in addition to knowledge of the dictionary meanings of words, *knowledge of culture and of context;* that is, knowledge of potential categories for SS-system generation.

Third, the markers Katz and Fodor attach to, for instance, "bachelor," rigidify and crystallize the word. The model does not adequately account for change, for novel language use. Constantly evolving cultural environments call for the possibility of transmuted dictionary meanings. Such transmutations result from rapidly evolving colloquial speech in everyday life, or from language variation in literary texts. Understanding of linguistic transmutations is also crucial in scientific languages, where, for instance, the meaning of supposedly invariant terms such as "mass," "field," "particle," "force," etc. changes from the context of Einsteinian physics to Newtonian physics (see Capek, 1961; Feyerabend, 1975; Hanson, 1958a; Kuhn, 1970; Toulmin, 1953).

Fourth, Katz and Fodor claim that a formulation of the speaker's knowledge of the world would be utterly impossible. The point is perhaps well taken with respect to dictionary items which are arbitrary by nature. However, SS-systems are a special case, for their quality of *semionicity* and *symbolicity* is necessarily motivated by characteristics outside normal dictionary meanings of lexical items. It is precisely these characteristics that must be specified, at least in so far as it is at this time possible.

Clearly, the Katz-Fodor model does not adequately account for the *semionic* and *symbolic* level of language use. That is, to be an adequate model it must include properly the SS-system whose codification corresponds to a distinct level of organization. Purely linguistic signs generated/perceived in the literal/sense exhibit only one aspect of SS-system functions. Yet *semions* and *symbols,* belonging to another level of organization, cannot be overlooked. Just as we possess knowledge of language, we must also possess a complementary form of knowledge of this secondary level. This complementary knowledge can be qualified by the following proposition:

PROPOSITION III: Proper construction/perception of SS-system entities in texts presupposes: (a) knowledge of potential and possible categories for the organization of SS-system entities at the secondary level, (b) knowledge of linguistic categories, and (c) knowledge of a shared culture-world.

In order to validate this proposition, in 1.33 I distinguish briefly between two types of knowledge. Then in 1.34 I establish a distinction between knowledge of innate and mechanical rules, on the one hand, and knowledge of embedded culture-bound rules on the other. Finally, in 1.35 I propose a typology of rules and strategies at the two levels referred to in 1.33 and 1.34.

1.33 *Toward a typology of knowledge of culture-world.* "Knowledge" as I use the term may be conscious or tacit (nonconscious). Conscious knowledge is that which is construed to be either literal or *semionic* and which is by and large readily explainable, at least from the perspective of a particular knowing subject. Tacit knowledge may: (a) be implicit knowledge which can be made partially explicit by the knowing subject (*semionic* and *symbolic* statements), or (b) remain perpetually implicit and in which case it has become "embedded knowledge" (*symbolic* statements).

Tacit knowledge separates what Ryle (1949) calls "knowing how" from "knowing that." The difference between these two forms of knowing is important for the present inquiry. Imagine a person who is learning to play billiards. He can first learn the rules and then after much practice develop a degree of skill at the game. Or he can observe others play, infer the rules, see how to play with skill, and then develop his own game by practice. What he usually does, however, is a combination of both. In whichever case, when he begins shooting the balls he must concentrate on each move. Soon he is capable of following the rules apparently without consciously thinking about them. Finally, his movements become somewhat automatic, and when he has become an expert at the game he can even determine his strategy almost without thinking. At this stage his knowledge of the game has become

embedded to the extent that if asked the rules he might hesitate and perhaps even be incapable adequately of explaining them. Or if asked to explain his moves he will be at a partial loss for words. But he can certainly *show* his moves. In other words, he knows *how* (by actions) but not *that* (by explicit articulation). In a sense he knows more than he knows he knows. His knowledge *how* with respect to the game has become embedded, after long hours of practice, such that he no longer possesses immediate and explicit knowledge *that*. Similar examples of embedment by habitual use could be given for tightrope walking, riding a bicycle, driving a car, playing a piano, etc. (for example, see Koestler, 1964; Merrell, 1982, 1983; Polanyi, 1958.)[7]

From the above example it is obvious that a portion of our knowledge *how* is not governed by innate or mechanical rules. It might well be that grammar rules are internalized and used by means of some innate capacity. In such case we must follow these rules rather closely when speaking whether we want to or not, speaking in such-and-such a way because that is how everybody is programmed to speak. On the other hand, the use of abstract "sublanguages" in science, emotion-laden "sublanguages" in poetry, mystical allusions in religious "sublanguage," or rather inelegant language when engaged in trivial chit-chat, presuppose culture-bound and relatively amorphous "language-games" which have become partly embedded through habitual use. This part of our knowledge *how* constitutes a set of culture-bound tacit conventions we possess such that we can know on nonconscious levels *how* to use our repertoire of language and SS-system entities in order to convey our ideas as effectively as possible (see Polanyi, 1958). This tacit form of knowledge also applies to nonverbal communication which has become habitual: the automatic bow of the subservient slave before his master, the gentleman tipping his hat before a fair damsel, even perhaps the bigot who stiffens when approached by a member of another ethnic group, etc.

Moreover, this portion of our knowledge *how* is analogous to phenomena of which we are only peripherally aware, but which we actively incorporate into our knowledge of the world around us: the ticking of a clock of which we are usually unaware but we become aware of it when it stops, the shape of the letters you are reading on this page of which you are not totally aware but only peripherally so since you are attending to the meaning behind these shapes, etc. The nature of this tacit awareness, although chiefly habitual, a pathway of least resistance, is not predictable in a mechanical sense. That is, the point at which one may detour from one's ordinary activity to focus on the ticking of the clock, the shape of the letters, etc. is indeterminate (Polanyi, 1958). Similarly, the point at which one

de-embeds an SS-system entity in one's scientific, literary, philosophical, or whatever "sublanguage" to perceive it and the entire system in which it stands in a different way is equally indeterminate. Or, the point at which one tacitly or consciously constructs a new SS-system entity to create a novel concept, idea, opinion, etc. cannot be foreseen.

Hence some rules must be "unconscious" and perhaps even innate, while others are nonconscious (tacit) and the product of embedded culture-bound conventions. In the second case rules are made to be used, but they are also repeatedly abused and broken – such as when SS-system entities are constructed/perceived by means of a transformation of lexical items as put forth in DEFINITIONS 1-I and 1-II.

1.34 *Mechanical rules versus embedded (tacit, that is, culture-bound) rules.* What pertains to mechanical rules in the billiard game example? The trajectories of the billiard balls can be studied scientifically by taking into account mass, velocity, momentum, elasticity, the surface conditions of the table, atmospheric conditions, etc. such that the resting state of the balls after each shot can theoretically be calculated, even if the scientist is ignorant of the rules of the game. Thus the game is explained on a physico-mechanical level in terms of cause-and-effect conditions. The explicit knowledge (knowing *that*) acquired from this explanation presumably consists of a set of universally valid formulae for explaining events in the physical world.

From another perspective, the conventional and culture-bound billiard rules, which perhaps have become partly embedded and tacit for the occasional billiard player, can ordinarily be explicitly described by the specialist. This is also a form of knowing *that*. However, what the specialist cannot do is predetermine the strategies each player will employ against the other. For example, during a game the configuration of the balls on the table after a shot can ideally be predetermined by mechanical rules of physics, and explicitly formulated culture-bound rules of the game can state a certain range of possibilities open to the player after each shot. However, the actual shot the player subsequently attempts and the general trend of the game cannot be foretold. Culture-bound billiard rules, then, govern a finite set of possibilities, but strategies entail a virtually unlimited number of potential combinations over an indefinite period of time. Such strategies are the product of (partly embedded and nonconscious) knowing *how* to play the game by following culture-bound rules and by adherence to physico-mechanical laws.

To continue the analogy, assume that two players might, while they are playing the game, carry on a conversation using grammatically correct sentences, although they are not conscious of the grammar rules they are using. These rules are part of a linguist's knowledge *that* when he reduces

them to a mechanistic formulation which describes precisely the linguistic possibilities accessible to each player. Yet these internalized grammar rules, followed to the letter, are incapable of ordaining *what* each of these players speaks, *when* he or she speaks it, and *where* he or she is standing around the billiard table when he or she speaks it. The utterances he or she can emit are potentially unlimited over time, even though their generation follows a definite set of rules. Consequently, he or she knows *how* to speak without possessing explicit knowledge *of* the mechanical set of rules he or she follows. And the strategies he or she employs when speaking by use of these rules are the product of (partly embedded and non-conscious) knowledge *how* to speak in certain situations and in certain contexts, and *how* to speak in novel ways so as to create new situations and contexts. Hence, his or her utterances, like his or her billiard strategies, are unpredictable.

1.35 *A typology of rules for SS-system construction/perception.* It is obvious from the above subsection that we must distinguish between *rules* and *strategies* with respect to the implicit form of knowing *how.* In this light, consider the following definitions:

DEFINITION 1-VII: Knowledge *how* to use language by following a set of *rules,* can be: (a) innate and/or tacit (knowledge of linguistic categories as put forth in PROPOSITION III), or (b) tacit by means of embedment into consciousness (knowledge of a shared culture-world as put forth in PROPOSITION III).

The mechanical operations involved when these rules are followed can be made conscious and explicit by the specialist (i.e., the physicist, linguist, billiard expert, etc.), and from an analytical perspective. This explicit knowing is knowing *that.*

DEFINITION 1-VII: Knowledge *how* to develop *strategies:* (a) is *selective* and *indeterminate,* since the subject has before him at any moment a given set of possibilities from which to choose, and (b) *potentially infinite over time,* since there is no way to determine the set of possible alternatives that might lie before the subject at any given future moment.

And, with respect to our present interests:

DEFINITION 1-IX: Knowledge *how,* by following a set of rules, to construct/perceive SS-systems in texts is: (a) at one level inborn (the capacity for transforming lexical items into SS-system entities as put forth in DEFINITION 1-II and which entail knowledge of potential and possible categories for the organization of SS-system entities as put forth in PROPOSITION III), and (b) at another level, tacit, through embedment into consciousness (as put forth in DEFINITIONS 1-III and 1-IV, and

with respect to internalized knowledge of a shared culture-world as put forth in PROPOSITION III).
DEFINITION 1-X: Knowledge *how* to develop *strategies* shares the same characteristics of *selectivity, indeterminacy,* and *potential infinity over time* as put forth in DEFINITION 1-VIII.

The model to be herein constructed must be capable of accounting for these characteristics.

1.36 In Part 1 I hope to have established the type distinction between language systems and "secondary modelling systems" at the "atomic" level of representative statements. With the above definitions, propositions, inferential statements, and examples in mind I now turn to Part 2 where I attempt to show the relationship between SS-systems in texts at the "macromolecular" level of "sublanguages," conceptual frameworks, and broad world-views.

Notes

1. I have limited the scope of this inquiry to written texts, maintaining that there is a fundamental distinction between writing and speech (see also Derrida, 1967; Goody, 1977; Merrell, 1982). In brief, the linear quality of speech is not spatial. In contrast, explicitly formulated grounds for knowledge (i.e., logic, mathematics, the generation of propositions and rules of argumentation) are inevitably visual as well as spatio-temporal; that is, they are realized as graphic signs in texts. With graphic representation, tables and lists can be constructed, conceptual boundaries can be sharpened, taxonomies can be constructed, hierarchies can be established. Moreover, by means of these abstractive activities, explicit rules can eventually be formulated which specify this two-dimensional visual and graphic order of things. In contrast, the unidimensional, linear nature of speech requires that it must ordinarily be internalized and used in relatively more tacit and implicit ways.
2. From this point onward when I refer to the construction/perception of "symbol systems" I mean the construction/perception of the figurative (fictional, metaphorical) aspect of the written text. This is distinct from the construction/perception of the text proper. Construction/perception of the linguistic aspect of the text differs from the construction/perception of the textual "symbol system," which is "extralinguistic." In this light, the "symbol system" pertains to the domain of what I will call a "secondary modelling system" (compare the "symbol system" as I use the term also to Hjelmslev's, 1961, "connotative semiotics").
3. In order properly to illustrate the distinction between language systems and "symbol systems" I will draw examples from isolated sentences. It must be kept in mind that these sentences are not meant to be examples of whole "symbol systems" or of texts. They are particles of data with which to, at a microscopic level, demonstrate a more general phenomenon.

4. Of course I cannot at this time adequately account for the emission of, say, statements (8) and (9) with alternative tones or intentions and in distinct contexts. For example, (8) might be uttered with an ironic or sarcastic tone in a scientific text, although irony is undoubtedly more prevalent in literary than in other texts. If, however, either (8) or (9) is uttered in an ironic tone it would become, due to that very fact, properly *semionic*. That is to say, the utterer would intend for certain lexical items to mean something "other than" what they would ordinarily mean; therefore they would be part of the *semion-symbol* system described by the totality of his utterances within that particular context (compare to the "stogie-cigar" relationship in 1.11).
5. Admittedly, I have taken Everett's quote out of context. His interpretation of quantum mechanics is extremely complex, accessible only to the specialist, and consequently I am not capable of understanding fully its more formal aspects. Nevertheless, I believe that the passage I have quoted effectively demonstrates that an imaginative leap, a metaphorical (i.e., "symbolic) image, is necessary for the production of novelty in any and all texts which are constructed with the purpose of presenting new hypotheses, world-views, fictional constructs, etc.
6. Ogden and Richards (1923) set up a triangular model in which the relation between "symbol" and "referent" is mediated by "thought or reference": their "symbol" would be similar to my "image," their "thought or reference" to my "concept," and their "referent" also to my "referent":

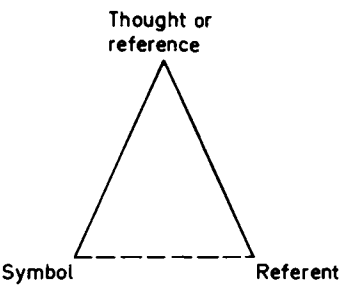


Figure 2.

7. Such habitual behavior may become part of a form of "collective unconscious." Schrödinger (1958), 12) observes that consciousness of our actions pertains only to those which are still in the process of being trained. At a much later time they can become a "hereditarily fixed, well-trained and unconscious possession of the species. In brief: consciousness is a phenomenon in the zone of evolution." (Compare this process to the concept of Butler, 1913, the nineteenth century writer-philosopher-biologist and opponent of Darwin, who maintained that habitual activity becomes with time less and less conscious and finally less and less subject to voluntary control as it sinks deeper and becomes embedded into the biological system of the organism).

PART 2

Conceptual Frameworks and "Sublanguages" Behind Texts

A system is, so to speak, a world.

Wittgenstein (1975, 178)

I begin Part 2 with three premises, developed in Part 1:

(a) SS-system entities are appropriated from specialized scientific, literary, philosophical, mythical, religious, etc., "sublanguages" (a "sublanguage," keep in mind, is a set of lexical items which are potentially transformable into SS-system entities on construction/perception of a text) (cf. DEFINITIONS 1-I & 1-II).

(b) SS-systems in texts are constructed/perceived by means of conceptual frameworks (which entail knowledge of culture-world and knowledge of potential and possible categories for the organization of SS-system entities at the secondary level) (cf. PROPOSITION III).

(c) (Re)construction/(re)perception of SS-systems entails a potential for the creation of radically new conceptual frameworks and "sublanguages," or for the alternation of existing ones (cf. DEFINITION 1-X).

The objective, with these premises in mind, is to set the foundation for a model of SS-system construction/perception by arguing for an epistemology of openness at broad conceptual levels: world perspectives from which texts are constructed/perceived.

2.1 On Incommensurable Paradigms (CFs)

2.11 *All relatively sophisticated and relatively complex texts are the partial expression of conceptual frameworks.* Compared to most other texts, scientific texts are methodically and rigorously constructed. The scientist has access, from within his particular scientific community, to a relatively homogeneous "sublanguage." Consequently, the textual SS-systems he constructs/perceives, consisting of explicit or implicit models with which to describe an aspect of the physical world, are relatively easily explainable – *semionic* discourse. Since scientific texts are in this manner relatively explicit,

they will be the chief focus of the following discussion. It must be remembered, however, that what is asserted is, to a greater or lesser degree, applicable to all texts (as will become evident in Parts 3 and 4).

Consider, with respect to the "macrosemantic" level of scientific texts in particular, the well-known *Weltanschauung* hypothesis proposed from diverse angles by Feyerabend (1975), Hanson (1958a), Kuhn (1970), Polanyi (1958) and others (see Suppe, 1974). Scientific activity, according to this hypothesis, is governed by holistic all-or-nothing world-views, or to use Kuhn's term, "paradigms."[1] The existence of these world-views or paradigms presupposes that, first, the scientist is not autonomous of his language nor is his language autonomous of him. This implies that *his knowledge is language-bound.* Consequently, the meanings of the terms in the particular scientific "sublanguage" he uses for developing his arguments by and large determine his perspective of the world, for him generally the only True Perspective. Second, the scientist can only with great difficulty escape his perceptual world. This implies that *his perception is bound to his specific scientific paradigm.* It determines what he will look for and what he will see in the world. It is now commonplace that the notion of an observer detached from the reality he observes is an illustion. The mind is both consciously and nonconsciously a participant in the world of objects. In this sense a scientific paradigm becomes a picture of the scientist's relationship with nature, and as this relationship undergoes alterations, the theory is changed or replaced. And third, the scientist cannot fully articulate his thoughts about the world – since the world is infinitely complex and language is a radically incomplete system of representation – nor can he totally comprehend what is implicit in what he expresses concerning the world. This implies that *the meanings he attaches to the terms he uses are bound to his perception of the world* (see also Bohr, 1958; Bridgman, 1950; Heisenberg, 1970).

In light of these presuppositions underlying the *Weltanschauung* hypothesis, I will argue: (a) that particular views of the world, in so far as they are partly portrayed in all texts, are not as "closed" as the general *Weltanschauung* hypothesis dictates, and (b) that conceptual frameworks, SS-systems, and "sublanguages," as I have defined them up to this point, are compatible with the *Weltanschauung* hypothesis in so far as they are generally conceived/perceived to be self-sufficient and adequately complete conceptual systems. That is to say, I attempt to validate the following proposition:

PROPOSITION IV: The construction (writing) as well as the perception (reading) of SS-systems in texts is governed by conceptual frameworks which can be, at any given moment, potentially opened.

This proposition in conjunction with the following definition connects the *Weltanschauung* notion of paradigms, or world-views, to the terminology of the present inquiry:

DEFINITION 2-I: Conceptual frameworks organize experience and represent at the most fundamental level a view, deeply embedded in a cultural form of life, of how the world is; hence conceptual frameworks are the structuring principle behind world-views. (In this light, when referring to a particular perspective of the world which is partially manifested in a text by means of an SS-system, I will generally use the term conceptual framework [abbreviated CF] while bearing in mind that a conceptual framework forms the basis of a world-view or paradigm [see Rescher, 1973, for a comparable definition of conceptual frameworks].)[2]

In order to demonstrate the potential openness of the conceptual frameworks we must address ourselves to two questions: How is it possible on a global level to step "outside" one CF (and consequently, one paradigm or world-view), and "into" another CF during text construction/perception? And, how, at the local level, is it possible to construct/perceive novelty in texts from within the same CF?

2.12 *A dilemma concerning "openness."* Let us at the outset assume that CFs (paradigms, world-views) can indeed be conceived as language-bound, perception-bound and *Weltanschauung*-bound systems according to the above presuppositions. In this respect they can be conceived as self-contained, self-confirmatory, and self-reflexive, and the texts constructed/perceived by them should ultimately reveal the same characteristics. However, there is a problem here. What prevents us from saying, in contrast to the "potential openness" of CFs as put forth in PROPOSITION IV, that ultimately a given CF and the texts portraying it consist of a holistic all-encompassing cosmology, and therefore they are such that they cannot transcend themselves. That is, like the omniscient eye that can see the world but cannot see itself, a CF (i.e., the texts written by means of a CF) can given account of the world but cannot say what it is itself (see Anderson Jr., 1975). In this sense, the human mind would not be able to mediate between alternative and incommensurable CFs, or between concepts, ideas, opinions, intuitions, etc. in texts, since it would be ultimately limited in its ability to transcend its own established way of conceiving and perceiving the world. How then, could one go "outside" one's CF to assimilate another CF portrayed through a text or in an argument? How could one stand independent of all CFs, texts and arguments, as it appears that Kuhn, Feyerabend, and others do when they study the process of scientific theory-

making? Or, what is more appropriate to this study, how could the writer of a text transcend his culture-bound imperatives to say something unique?

If indeed CFs (paradigms, world-views) are real, and if texts by and large portray them, then change in CFs and texts is obviously not possible without their being "opened." They must somehow be subjected to new ideas, opinions, intuitions, clarifying statements, counterarguments, etc. from without. Moreover, there must be some mediating "axiom" through which a person can be "converted" from one CF to another. But, the question remains: If CFs and their respective texts are considered ultimately as self-contained, self-confirmatory, and self-reflexive, then how is it logically possible for them to be so "opened"?

2.13 *Feyerabend's solution to the dilemma.* Feyerabend tells us that scientific theories (i.e., theories as they are portrayed in scientific texts) should not be examined strictly from the "inside." What is needed is "an external standard of criticism, we need a set of alternative assumptions . . . an entire alternative world, *we need a dream-world in order to discover the features of the real world we inhabit* (and which may actually be just another dream-world)" (Feyerabend, 1975, 32). It is necessary and above all possible intentionally to "step outside the circle." New conceptual systems can be invented by importing ideas from outside science, "from religion, from mythology, from the ideas of incompetents, or the ramblings of madmen," rather than limiting ourselves to conventions of "logic," standards of "rationality," or conventional "laws of nature." In science what at the outset appeared to be the most outlandish of notions (i.e., the Copernican universe) have become dogma. Hence, continues Feyerabend, why not take a serious look at today's unorthodox practices: poetic, religious, and mystical experiences, the reports of Carlos Castaneda, the "logic" of Zen Buddhism, or other successful practices (such as acupuncture) which have demonstrated their viability although they remain outside the established boundaries of Western Science? (Feyerabend, 1975, 68, 50-52 & 189-91).

At the outset this suggestion seems monstrous! But Feyerabend argues persuasively that revolutionary scientists of the past did not refute established scientific theories with convincing empirical evidence. On the contrary, by the use of compelling arguments they lured people away from their relatively successful CFs to unfinished and seemingly absurd hypotheses which were nevertheless attractive in terms of their internal cogency and explanatory power (Feyerabend, 1975, 141-43). It is precisely this type of activity which constitutes the "game of science." Feyerabend tells us that our cosmologies are not inexorably monolithic, they only seem that way, locked as we are in our Western World traditions. Beyond the early Wittgenstein's limits of

(logical) languages lies the domain of the irrational and nonsense, where one should not tred lest one consign oneself to silence. Feyerabend, in contrast, desires to rush boldly into that very domain, for only then, he believes, can we "see" a new world, describe what we "see" (albeit vaguely at first and then only incompletely), and invent daring alternatives to the present theories.

In this sense, and to use the terminology of the present inquiry, the generation of *symbols* or culturally embedded *semions* from within particular CFs always implies incomplete awareness concerning how those *symbols* or *semions* are being used and how they can be used in texts. A new CF can only be acquired by observing, intentionally or unintentionally, the old CF from a perspective which would ordinarily be considered irrational, false, meaningless, or nonsensical. In this way a new possible world can be created which, if it more effectively accounts for the empirical data at hand than the old CF, may become The Perceived World. Hence, with the continuous construction of new possible worlds, new *semions* and *symbols* are constantly created, and old *semions* and *symbols* are used in novel ways.

Feyerabend's solution to the dilemma appears well and good. Nevertheless, I do not agree totally with him in particular and with the *Weltanschauung* theoriests in general concerning the absoluteness of their so-called *Gestalt* "switches" into new and incommensurable "paradigms." I believe that the notion of incommensurability, when applied to general conceptual systems (including science), is somewhat overplayed (for supporting criticism of the *Weltanschauung* hypothesis from diverse disciplines, see Barbour, 1974; Kordig, 1971; Lakatos & Musgrave, 1970; Laudan, 1977; Scheffler, 1967; Shapere, 1974; Toulmin, 1974; Trigg, 1973). Consequently, in the sections that follow I will propose a somewhat revised version of the *Weltanschauung* hypothesis with which to account for *all* conceptual systems, scientific or otherwise.

2.14 *CFs are inevitably plagued by "semantic lag."* One problem with the radical *Gestalt* "switches" is that they do not readily go to completion. They are hindered by a "semantic lag" – since many of the old terms scientists use in new CFs still contain part or all of archaic mental images (meanings). Rather than one scientific CF categorically replacing another, or the meanings of one set of terms replacing another, generations may be required for a community to adjust to a new way of thinking (for example, Bridgman, 1950; Planck, 1949). Of course, Kuhn, Feyerabend, and others are aware of the fact that the defenders of a scientific body of knowledge will resist conversion to another perspective, rooted as they are in the traditions of their community. However, I am speaking of more firmly entrenched thought, *modes of reasoning that have become embedded – semionic*

discourse without immediate awareness of its underlying *symbolic* foundations.

For instance, Capek (1961) asserts that centuries of "conditioning" have integrated the Newtonian CF so completely into our "intellectual subconscious" that "we fail to realize that the very terms 'motion' and 'displacement' are thoroughly inadequate because they are tinged with misleading classical associations. The continued use of these terms . . . indicates the reluctance of our Newtonian subconscious to depart from traditional habits of thought" (Capek, 1961, 264; see also along comparable lines, Heisenberg, 1958; Toulmin, 1953, 1967). This "semantic inertia" or "semantic lag" I speak of is responsible for numerous incidents in scientific texts, and all other texts for that matter, where obstinate terminology reflecting conservative underlying mental habits serves to inhibit the emergence of novel ideas (compare to the notion of embedment in 1.2).

In this sense, then, it can be stated that *semions* and *symbols*, generated from within particular CFs, are always constructed/perceived with incomplate awareness concerning how they *are* being used and how they *can* be used. That is to say, one is always, to a greater or lesser degree, unaware of some of the implications behind the texts one constructs/perceives. This incomplete awareness is partially the result of "semantic lag," and the "fuzzy area" wherein "semantic lag" lies is precisely what can give rise to mediating "axioms," propositions, inferential statements, ideas, opinions, and even whims, which serve to open one's eyes to a new perspective. Hence a new perspective (CF) is acquired either intentionally or unintentionally, when one becomes aware of this "fuzzy" area. And, whether intentional or unintentional, its acquisition always occurs at some unpredictable moment by a specifically human ability to "hit upon" what appears at that particular moment and for that particular person to be a unique and correct solution to the problem situation at hand (see in general Peirce's, 1960, "abduction," Poincare's, 1952, process of mathematical creation, Koestler's, 1964, "bisociation," Bateson's, 1972, "deutero-learning," Hanson's, 1958b, "logic of discovery," the "reframing" of Watzlawick, et. al., 1974, and even the "irrational," but always incomplete, *Gestalt* "switch" of the general *Weltanschauung* hypothesis).

Although more detailed treatment of this phenomena can only be forthcoming in Parts 3 and 4 when the necessary foundation has been established, it is slowly becoming apparent that there exists an affinity between the generation of novelty in scientific texts and novelty in mythical, religious, philosophical, literary, etc. texts. The chief difference between all these texts is in degree, rather than kind: the extent to which discourse is governed by implicit and embedded CFs as opposed to more explicitly articulated and

articulable CFs, and the intensity and relative abundance of *semions* and *symbols* as descriptive or explanatory devices. There exists no clear-cut boundary between the different modes of expression. Rather, it is a continuous spectrum. In this sense, the construction/perception of all SS-systems in texts is governed by particular CFs whose boundaries are not-so-precise-as hoped in the sciences (Feyerabend, 1975; Schrödinger, 1961), and whose boundaries are usually relatively vague in the humanities and the arts, yet still the embodiment of the same human cognitive process (Bronowski, 1966; Hofstadter, 1979; Laszlo, 1972; Miner, 1976).

2.15 *Preliminaries to an alternative solution to the dilemma: a restatement of the problem.* Consider the following, which synthesizes above arguments and points out the pathway for future subsections:

PROPOSITION V: CFs are only incompletely, and with an inevitable degree of vagueness, portrayed through SS-systems in texts.

That is to say, CFs are portrayed either explicitly or implicitly in texts by means of the appropriation, from particular "sublanguages," of the essential SS-system entities in order most adequately to convey the hypotheses, concepts, ideas, intuitions, emotions, etc. possessed by the author. However, given the psychological and physiological limitations of all human beings, CFs can be no more than incompletely articulated in a finite text. Moreover, the articulation of CFs in texts is inexorably tinged with a degree of vagueness. This vagueness is the product of, once again, "semantic lag": old word images (meanings) from "sublanguages" appropriated for use in SS-systems that have not yet caught up with thought processes (from within particular CFs). And "semantic lag" causes difficulty in the construction/perception of precise thoughts by means of SS-systems. Furthermore, "semantic lag" complements the notion that CFs are "incompletely . . . portrayed through SS-systems in texts", as put forth in PROPOSITION V. If CFs, "sublanguages," SS-systems, and texts could be simultaneously grasped in their totality by some Laplacean Superwriter or Superreader, "semantic lag" might not be an epistemological necessity. Human finiteness, however, demands the existence of this phenomenon. And it is precisely due to this phenomenon that texts, SS-systems and CFs are repeatedly opened, for if a given conceptual system were viewed as complete, then it would not, and could not, be opened for the incorporation of new information. Novelty would be accepted only when that very completeness might be questioned.

In this light, the next step, in order to provide an alternative solution to the above-mentioned dilemma, is to define more adequately the relationship

between all SS-systems derived from "sublanguages" (scientific or otherwise), all CFs, and the natural languages possessed by all speaking human beings. Then we will be in a position better to understand the role of "semantic lag" in the transition from one CF to another by means of SS-systems in texts.

2.2 SS-Systems and "Sublanguages" Within a Broader Context

2.20 Consider these definitions:

DEFINITION 2-II: LINGUISTIC CAPACITY (which is included within some as yet undefined biologically grounded COGNITIVE CAPACITY) includes the sum total of all NATURAL LANGUAGES, and each NATURAL LANGUAGE includes a number of SUBLANGUAGES (i.e., the "sublanguages" of science [Western, non-Western, "primitive"], literature philosophy, myth, religion, etc.).
DEFINITION 2-III: A relatively sophisticated and relatively complex SS-system in a text, generated by means of entities from a particular SUBLANGUAGE, is inevitably used in reference to that SUBLANGUAGE of which it is a member, and in so doing it ultimately refers to itself.
DEFINITION 2-IV: All relatively sophisticated and relatively complex SS-systems are incomplete and/or inconsistent.

In the following subsections I relate the notion of SS-systems, texts and SUBLANGUAGES in these definitions to the notion of CFs as outlinted in 2.1.

2.21 *The relationship between SUBLANGUAGES and CFs is dynamic.* Concerning DEFINITION 2-II, LINGUISTIC CAPACITY presumably derives from an innate structuring mechanism (Chomsky, 1965, 1975). The distinction I make between SUBLANGUAGES and LINGUISTIC CAPACITY on the one hand, and between SUBLANGUAGES and NATURAL LANGUAGES on the other, stems from recent and apparent breakthroughs in genetics and linguistics. If language ability is genetically based, as Lenneberg (1967) and others argue, then all normal humans possess an innate LINGUISTIC CAPACITY which is species-specific and independent of the peculiarities of NATURAL LANGUAGE. This LINGUISTIC CAPACITY is also preceded by an individual's maturation of a more general COGNITIVE CAPACITY. In this sense, NATURAL LANGUAGES are selective. The properties of a given NATURAL LANGUAGE occupy only a portion of the human potential represented by LINGUISTIC CAPACITY, while another

language will include a distinct portion, but there will be an overlapping area between all languages which permits for similarities and universal characteristics.

Other studies have indicated certain parallels between the genetic code – which appears to be identical for all organisms – and human speech – which has no readily distinguishable analogue in animal communication (see Beadle & Beadle, 1966; Gerard, Kluckhohn, & Rapoport, 1956; Jakobson, 1973; Masters, 1970). In line with these discoveries, LINGUISTIC CAPACITY, or the ability to learn NATURAL LANGUAGES, is transmitted biologically while SUBLANGUAGES are chiefly transmitted culturally from generation to generation by natural and formal learning processes. In this sense: (a) SUBLANGUAGES possess a relatively high level of adaptability or "openness" to novel situations (compare to PROPOSITION IV), and (b) SUBLANGUAGES are potentially the manifestation, when partially embodied in SS-systems, of culture-world knowledge (compare to PROPOSITION III).

Figure 4 (next page), representing the cognitive aspects of human communication, illustrates the above points (compare to Lenneberg, 1967, 363-65). One can use and understand SS-systems constructed by means of a scientific, literary, philosophical, mythical, religious, etc. SUBLANGUAGE (SL) from within a given CF. And that (SL) can fall within the domain of a NATURAL LANGUAGE (NL). In such case, it encompasses that portion of the CF which is adequately explainable by means of SS-systems generated by use of the (SL) and using lexical items from the (NL). The SS-system aspect of these explanations consists of sets of *semionic* (as well as *symbolic*) statements from within religious-ritualistic cosmologies or artistic CFs, or sets of statements which are primarily *semionic* from within more rigorously abstract quasiscientific and scientific CFs.

The portion (N) and (O) of a CF are at a given moment in time *semionically* and *symbolically* inexpressible by means of the present state of one's (SL). However, (N) and (O) represent a *potential.* They can become part of one's *semionically* explicit or *symbolically* implicit formulations: (a) when the "semantic lag" between one's altered CF and past modes of expression is gradually erased, or (b) when the embedded aspects of the conception/perception of one's SS-systems is raised to more conscious levels (in line with PROPOSITION IV). That is, when some of the "mysteries" or "anomalies" within a particular CF are explained, what was potentially explainable in (N) and (O) becomes actually explainable in (SL). (O) is the domain of a deeper implicit level of conceptualization. This portion of a CF is exclusively "analog" or "iconic" in nature. It may perhaps be tacitly communicated but not (or at least not yet, we can suppose),

articulated explicitly and by means of the SS-system entities in an (SL). The (SL) has not yet "caught up" with this aspect of tacit knowing (see, for example, Heisenberg, 1958, concerning this characteristic of scientific SUBLANGUAGES).

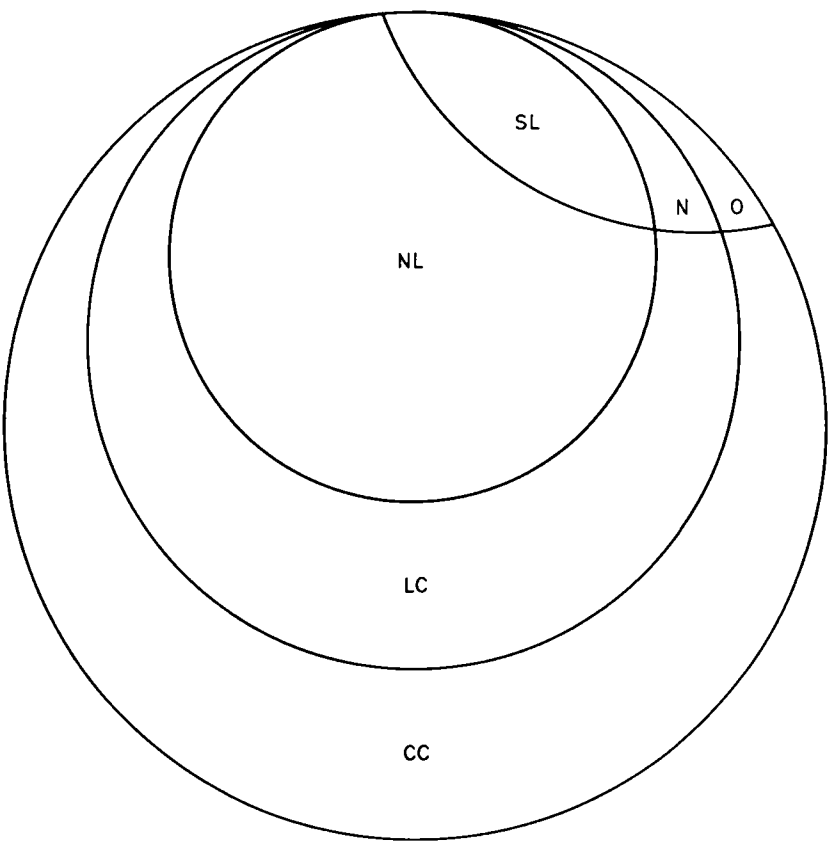


Figure 4

Hence it becomes evident that the zone representing CFs has no absolute boundaries. What pertains to consciousness and explainability in (SL) can become embedded (tacit) in (N) and (O), and what is in (N) and (O) can potentially become conscious and explainable.[3] (This is commensurate with embedment/de-embedment as discussed in 1.2, with PROPOSITIONS I and II, and with DEFINITIONS 1-III to 1-VI.)

2.22 *SS-system entities, to be properly interpreted, are self-referential.* DEFINITION 2-III (which corresponds to one of the clauses in PROPOSITION IV) bears indirectly on Russell's "Theory of Logical Types" (Russell, 1956; also Copi, 1971). To paraphrase and simplify (I hope without doing violence to a rather complex formulation), an individual of a particular class cannot be considered as the class itself, and conversely, a class cannot be simultaneously a member of itself. The class of all men is not itself a man and a man is not the same as that class defined as man; they belong to different levels of abstraction (logical types).

For instance, the Epimenidean "liar" paradox:

(1) All Cretans are liars said the man from Crete.

falsely places an individual man on the same level as a class of men. If the utterer of the statement is lying, then all Cretans are not liars, and if all Cretans are liars, then he cannot be lying. The utterance *refers to itself* in such a way that a member of a class is confused with the class of which it is a member, and this rupture of logical boundaries constitutes a paradox.

But self-reference does not always involve paradox. "Category mistakes" are, like type errors, the result of a boundary confusion. For example, the two statements:

(2) Chicago is a large city.

(3) "Chicago" is trisyllabic.

exist on distinct levels. (2) refers to the object, (3) to the word which refers to the object. To state that:

(4) Chicago is a large city and trisyllabic.

is to breach the frame between the two levels. However, a paradox does not ensue in the Russellian sense, for there is no member-class confusion Chicago (a city) is not placed in the same frame with the class of all cities.

Moreover, such statements as:

(5) This sentence is true.

(6) This sentence contains exactly six words.

are self-referential but not paradoxical. When comparing statement (1) with (2) through (6) it becomes apparent that the paradoxical statement in addition to being self-referential, contains *negation* (or *contradication*, in the sense of the lie being what is *not* true) and it is *viciously circular.*

Let us now relate the above to the concerns of the present inquiry In light of DEFINITION 2-III, the construction/perception of a set of SS-system entities in a text implies the appropriation of transformed lexical items. As was also pointed out in Part 1, transformed lexical items become SS-system entities at the "secondary level", but, we must admit, their proper construction/perception demands some form of awareness of *both* levels For instance, to use "lion" in place of "that man" in an utterance without

transformation of the lexical item is to construe a metaphor literally. On the other hand, SS-system entities whose reference to a given repertoire of lexical items cannot be established will be, like Carroll's jabberwocky, relatively unintelligible, or they will be construed as absurd, nonsensical or perhaps simply meaningless. Say, for instance, "The world is like an orange" to the flatlander!

In addition, constant intensional reference must be made, on constructing/perceiving SS-system entities, between the "secondary" and "primary" levels. But such reference also entails self-reference. To use "lion" in place of "that man" is, almost-simultaneously, to be conscious or tacitly aware of "lion" *as* a lexical item *and* "lion" as what the lexical item *is not*. That is, there must be awareness of it as an SS-system entity *and* as an ordinary lexical item. Under this condition, focus on "lion," to be properly understood in this context, must oscillate (be oscillated) between the "secondary" and "primarily" levels. The relationship established here is similar to a category mistake – except that, unlike the case of utterance (4) where oscillation must exist between the two uses of "Chicago," there is no necessary and explicit reference to the word itself. And it is comparable to Russell's type error, but, since the two levels in question must exist in distinct frames, there is no paradox.

Yet we cannot stop here, for the SS-system entity's self-referential characteristic remains to be established. If, in the "lion" example, there is no explicit reference to the word itself, there must nevertheless be cognizance that it is used as what it ordinarily would *not* be. The word must become, at least implicitly, opaque, for if there is absolutely no awareness of its unorthodox use, then it will be construed as transparent, literal. Hence, in the oscillation between the word's ordinary and extra-ordinary use at the "primary" and "secondary" levels respectively, there must be at least tacit recognition of its opacity. In this sense, attention or reference to the word itself in order to interpret it properly is somewhat similar to interpreting an ambiguous utterance, such as "Flying planes can be dangerous," where "flying" must refer to itself in order to be construed as what it previously was not and then it must be placed in another complementary frame to give it another meaning. That, precisely, is where self-reference comes in (I will shortly discuss its paradoxical or contradictory aspect) (see also Merrell, 1983).

Of course we are all capable of enacting this double reference in the twinkling of an eye, and we do it ordinarily without even having to think about it. Nevertheless, the word's opacity must be somehow tacitly acknowledged, for otherwise, how could we transfer it into another frame if, when transparent, focus must remain exclusively on its meaning, or its

intensional referent? Self-reference need not be, and indeed it is usually not, explicit. For if we follow Bateson (1972), Laing (1965, 1969, 1971), Ruesch and Bateson (1951), Watzlawick, et. al. (1967), Watzlawick (1977) and others, misunderstandings, confusion, and mental disorders in general entail errors through self-referentiality which exist by and large at non-conscious levels.

2.23 *All perspectives are incomplete, or they are inconsistent.* DEFINITION 2-IV bears on Gödel's earth-shaking theorems proposed in 1931. Gödel proved that all relatively rich mathematical systems are ultimately *incomplete* (they are not provable from within) or *inconsistent* (if provable from within, then they are not free of hidden contradictions). That is to say, Gödel demonstrated that in any given relatively rich system there exists at least one axiom that can be true if, and only if, it is not provable from within the system. The system is therefore either incomplete in that it cannot verify at least one relevant truth, or else it is self-referentially inconsistent and untenable in that it ultimately proves a falsehood (see Hofstadter, 1979, and Nagel & Newman, 1964, for a layperson's exposition of Gödel's highly abstract proof; and with respect to Gödel's theorems in light of scientific and other CFs, see Bronowski, 1966; Hutten, 1962; Polanyi, 1958; Schlegel, 1967).

Allow me for a moment and by way of relating Gödel's theorems to the present concerns, to speak more generally. Every perspective of the world is, by its very nature, partial, a cut out of the universe which necessarily ignores other possible perspectives. There is, and there can be, no God's-eye view of the universe in simultaneity. In this sense all particular perspectives are limited, incomplete. Yet each incomplete and closed perspective, if conceivably perfectly consistent, would be such that certain intelligible statements could not be made from within it that could be made from without. And, if the system were inconsistent from within, anything could conceivably be made intelligible, which would really be useless, for with such a system there could be no real order. Bronowski (1978, 78-79) in this respect tells the following story which, he admits, may or may not be true to fact but nonetheless relevant:

> Russell is reputed at a dinner party once to have said, "Oh, it is useless talking about inconsistent things, from an inconsistent proposition you can prove anything you like." Well, it is very easy to show this by mathematical means. But, as usual, Russell was much cleverer than this. Somebody at the dinner table said, "Oh, come on!" He said, "Well, what shall we say, 2 = 1." "All right," said Russell, "what do you want me to prove?" The man said, "I want you to prove that you are the pope." "Why," said Russell, "the pope and I are two, but two equals one, therefore the pope and I are one."

With this real-life example, and in light of Gödel's theorems, Bronowski (1978, 79) goes on to tell us that "it is useless to deal with inconsistent systems. Yet we have the fact that every closed formal system, if it is consistent, is not able to prove statements that I *can* prove standing outside the system." This is necessarily so. Intuition even tells us that it is so, for the universe, in its entirety, is unintelligible to a finite being. In order for it to be made at least partly intelligible it must be cut into a particular set of parts; that is, it must be made finite. But if finite, it is incomplete, and if not incomplete (i.e., able to account for the entire universe in simultaneity) then it must be inconsistent, for it contains, somewhere, some "axiom" the truth of which lies outside the accountability and intelligibility of the finite being in possession of that presumably complete system.

I must also mention here that the importance of negation cannot be overstressed. A particular cut in the universe *is* what it *is* only with respect to what *was not* cut out. A cut (or figure) must be made before that which is outside (the ground) can be distinguished (for further discussion see Merrell, 1983). Negation necessarily follows affirmation. To make a cut is to affirm something. To repeat the cut is to affirm what has already been affirmed, and hence there is no novelty in the true sense. To deny the cut, on the other hand, is possible only in regards to the prior existence of the cut. In this sense negation is properly interpreted as a binary rather than a unary relation: it is the operation by means of which what is, is connected to, but at the same time contrasted with, something that it is not (see also Merrell, 1982, 1983, and especially Spencer-Brown, 1972).

Gödel's theorems also stem from self-reference – of the type discussed in the preceding subsection – as well as from negation or contradiction. A simple, and commonly used, example is the "liar" paradox, or its more simple variant: "I am lying." Here, the speaker refers to himself with a pronoun which is at the same time the subject of the utterance which attests to the truthfulness of its being false. The subject-as-speaker is automatically implied without the fact having to be explicitly stated (cf. the implied self-referentiality from above). And in this particular case, a paradoxical situation is also created, for if the speaker is lying, then he is telling the truth, and if he is telling the truth, then he is lying. The statement is true if, and only if, it is false.

Gödel's theorems also bear similarity to Tarski's (1956) truth theorem according to which the truth of a consistent system cannot be determined from within that system. In this sense, no system can be rich enough semantically to testify to its own truth-value. For example, the truth of the following statement, which embodies a very general model of the universe:

(7) "The universe is a machine."

cannot be determined from within, but only with a necessary appendage from outside the system, like this:

(8) " 'The universe is a machine' is true."

"Is true" refers to the preceding clause and hence it lies outside it, affixed to it from a perspective necessarily outside the realm from within which the statement was made. It is, of course, impossible to make the statement "as if" true and at the same precise instant comment *about* the truth-value of itself, for the semantic system and a statement declaring its truth must exist in distinct frames.

But is this not how we perceive scientific (or any other) models of the universe, from within rather than from without? If we believe that the universe is such-and-such, do we not automatically affix the truth-value clause implicitly and tacitly? And, is this not precisely the way we perceive any and all fictions and figurative uses of language, by tacitly acknowledging their "as if" value? – for example, recall the "man = lion" discussion. Once again, implicit self-referentiality appears to be endemic in our conception and perception of our world.

Delong (1970, 227) states in this respect that:

> . . . it follows from Tarski's truth theorem that no formal system is rich enough to state its own semantics. But what is the difference between an interpreted formal system and an ordinary scientific theory? The only apparent one is that of rigor. Therefore, it seems to me that this result applies to all comprehensive theories whatsoever. Any fixed comprehensive account of reality which states its own truth-conditions could not possibly be true, but only mythical or fictional.

I tend to agree, but only after adding the ammendment that mythical and fictional (literary) texts, as well as scientific models, do not necessarily state their own truth-conditions from within: they are tacitly implied by the thinking, intuiting, feeling, or believing human being, by the *self* (or the *mind*) (see Bronowski, 1966; Schlegel, 1967).

2.24 *SS-systems are made intelligible "as if" they were complete and consistent.* Now, in order to get a better grasp on the relevance of Gödel's theorems to the above definitions, allow me to propose what I will call the "unintelligibility thesis."

First, I must explain that I will use *unintelligibility* and *truth* rather than, as Gödel, *provability*. Yet in a certain way a mathematical theorem made intelligible from within a particular system is a mathematical theorem proved. How can this be? Proof and provability are *syntactic* terms. A theorem, when proved, is left uninterpreted, and consistency is determined properly from within. Moreover, provability can vary from system to system.

For instance, the Pythagorean theorem is provable within Euclidean geometry, but not within Lobachevskyan geometry. Intelligibility, with respect to SS-systems, is in a similar sense *syntactic* also. Like provability, the intelligibility of an SS-sentence depends upon a given system and the set of assumptions in it, and it remains uninterpreted; only *after* an SS-sentences is made intelligible can it then be interpreted. Intelligibility also varies from SS-system to SS-system, since they are all culture-bound, *Weltanschauung*-bound, and bound to language use. What is from one perspective intelligible, from another may be partly or wholly unintelligible (e.g., Newtonian/Einsteinian science, waking/dream experiences, Eastern/Western religions, or the incompatibility between, say, works by Kafka and Balzac, or Romantic and Classical poetry).

On the other hand, the *semantics* of a formal system, more appropriately logical than mathematical, entails truth-conditions, and hence interpretation by relating the set of symbols in the system to a set of objects outside it. Like the semantics of logic, an SS-sentence can be interpreted as true, false, or nonsensical (but always intelligibly nonsensical). For example, the figurative sentence, "John is sharp," may be interpreted as true if from one perspective John is considered to be witty, as false if not, or as nonsensical if, say, it is found on the fifth line of a cake recipe.

Now let us proceed to the "unintelligibility thesis": a heuristic, rather than formal, counterpart to Gödel's theorems. It is rather obvious that the subject of "That man is a 'lion'" is made adequately and metaphorically intelligible by proper relation to its object. In other words, for the relation between "That man" and "lion" to be properly intelligible within an SS-system, there must be at least tacit acknowledgement that the copula does not equate identities. It only establishes metaphorical (i.e., SS-system) connections. Yet for these connections to be established there must, in turn, be at least tacit awareness of the literal meanings of the words as ordinary lexical items. In this sense, the entire system within which an SS-sentence is made intelligible must contain the following two conditions each of which represents a potential interpretation and both of which may be tacitly acknowledged:

(a) X, which implies that "That man is a 'lion'" is SS-intelligible and not literal.
(b) Y, which implies that "That man is a 'lion'" is SS-unintelligible and literal.

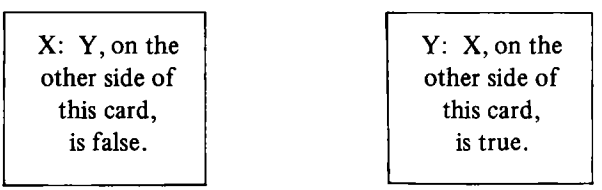
Notice that both conditions contain the SS-sentence in question. This is, it will shortly be observed, a crucial point. Let us call the SS-sentence p for short. The two abbreviated conditions become:

(a) X: p is SS-intelligible and not literal.

(b) Y: *p* is SS-unintelligible and literal.

Assume that X is the case (i.e., "That man is a 'lion'" is made SS-intelligible). The problem is that since both conditions refer to *p*, they must be, through *p*, interdependent: hence they refer to one another, and each necessarily implies a statement concerning the other's intelligibility. That is, due to the interdependency between X and Y, X can be itself intelligible if, and only if, it is, of and by itself, unintelligible (since it must be dependent upon the falsity of Y in order for its intelligibility as an SS-sentence to be established). In contrast, it might be supposed that Y can be intelligible of and by itself (since, if intelligible, it need not necessarily reflect on X in order for its intelligibility to be established). Yet Y, if intelligible, implies that its inverse is necessarily false. In other words, due to their interrelatedness, X implies a statement concerning the intelligibility and truth-value of Y, and vice versa.

Since I have interjected truth-values (semantics) into the discussion, let us continue along these lines. In view of the interdependency between X and Y, suppose we put the above pair of conditions, (a) and (b), on the two sides of a card along with an assertion of truth or falsity with respect to each, like this:



If *p* is properly an SS-sentence, then X must be construed as true and Y as false. That is, to perceive the SS-sentence figuratively implies tacit acknowledgement that condition Y is not the case. This seems rather clear-cut. However, a paradox becomes evident, for the system, "speaking" of its own truth-values, becomes inconsistent. If X is true, then Y must be false. But if Y is false, then X is necessarily false also, but if such is the case, then Y is true.

The way out of this dilemma is to view, on considering potential SS-system entities, the "primary" and "secondary" levels as being two distinct systems. At the first level, from perspective Y, a statement can be made *about* the truth of X, and vice versa. Yet there must be, for an SS-system entity to be made properly intelligible, at least tacit awareness of both levels (systems) due to their condition of interdependency. In this sense, exclusively at the "secondary" level unintelligibility (incomplete inter-

pretation) must reign supreme, for an SS-sentence cannot be interpreted properly without the existence of the "primary" level. And, if focus remains solely at the "primary" level, what would otherwise be an SS-system entity is falsely (inconsistently) interpreted, for its property of fictionality cannot become evident. In a certain way of speaking, an SS-sentence is properly intelligible if, and only if, it is unintelligible from within. That is, it can be made intelligible (consistent) only by reference to the "primary" level at which point its falsity (inconsistency) must, from that level, become apparent.

Thus the construction/perception of SS-sentences, from the relatively simple example discussed here to exceedingly complicated ones, depends upon the capacity to render what is not "as if" it were, by making that which is from alternating perspectives incomplete and inconsistent appear, at a tacit level, "as if" it were not so. And, if we proceed from individual SS-sentences to texts, and finally to holistic cosmologies which are incomplete and invariably inconsistent when portrayed from within broad CFs and by means of SUBLANGUAGES, in each and every case a world has been ordered by means of the same remarkable human capacity.

What I have tried to show is what we really knew all along, though somehow, as our conceived/perceived "real" world became complexified, we lost awareness of it. And, I hope I have done so without unduely vulgarizing Gödel's subtle proof the complexity of which is, for one of my limited mental capacities, only with great difficulty comprehended.

2.25 *The mind resists closure of SS-systems.* Following from the previous subsection, all SS-sentences are adequately interpreted solely from without, and the system in which they lie is incessantly opened by the thinking, intuiting, or feeling *self.* The creation of fictional and figurative forms, by opening conceptual systems, is necessary "to provide that vision within which it is possible to have a science at all, that is, to provide a goal and a framework in which the morale and energies of man may be maintained" (DeLong, 1970, 227). In other words, to make the world intelligible requires not only cuts, but also fictions, the imagination of a world "as if" it were such-and-such. And the creation of a fiction in all cases requires opening a conceptual framework eventually to interpret it either as true, false, "as if" true, or merely nonsensical. But on opening a system, on perceiving a conceptual framework from an outside vantage point, one is still limited to one's *self,* one's *mind.* The mind cannot transcend itself, but at the same time it constantly enlarges itself by its experiences – a constantly expanding horizon (for further discussion on the above topic, see Bridgman, 1950, 1959; Bronowski, 1966; Hofstadter, 1979; Hutten, 1962; Merrell, 1982, 1983; apRoberts, 1974).

In this light, and in consideration of the above presuppositions concerning the *Weltanschauung* hypothesis, just as *language, meaning, world-view,* and *perception* are inseparable from one another, so they are also inseparable from the general CFs that lie behind them. But whereas *language, meaning, world-view,* and *perception* might appear to be locked into a closed CF, the human *mind* incessantly resists closure (see Bridgman, 1950; Bronowski, 1966). And this resistance to closure perpetually defies rigid categories. It is for this reason that, like the *strategies* and culture-bound *rules* from DEFINITIONS 1-IX and 1-X, the precise moment when, say, a scientist "opens" his CF is unpredictable. Furthermore, the nature of a new CF which can then be constructed and temporarily closed cannot be determined *a priori.* One thing is certain, however, it will inexorably be incomplete, and ultimately inconsistent. Hence self-reference of sentences, of logical systems, of SS-systems, and of CFs is constantly mediated by human minds through the addition of intuitions, assumptions, feelings, clarifying statements, counterarguments, new premises ("axioms"), etc. which enrich all these systems but which, in the Gödelian sense and like paradigms or world-views, cannot be foreseen nor proved *a priori* to be free of additional contradictions. Hence all SS-systems generated from SUBLANGUAGES and derived from CFs, scientific and otherwise, are subject to the equivalent in human communication to Gödel's theorems. Complex SS-systems are invariably incomplete and/or inconsistent because there eternally exists something implicit, something left unstated and unstatable in them. They are incomplete without reference to themselves concerning their own validity or their ontological status. But when they refer to themselves the implications of Russell's paradox (inconsistency) can threaten to become manifest. That is to say, the validity or ontological status of any system depends upon the holder of that system assuming this Tarskian statement:

(9) "'X' is true."

or for fictive systems:

(10) "'X' is 'as if' true."

The embedded clause, 'X', of the statement is tacitly opened and implicitly completed by the mind, or the believer of a system which accepts on "faith" the validity and ontological status of that clause. Yet since the statement is *implicitly* self-referential it is once again closed and it once again potentially becomes inconsistent. Since the embedded portion of the statement is, with respect to metaphors, scientific models, myths, fictions, etc. a fictional construct in the beginning, it can be true if, and only if, it is not really true. (This line of reasoning is commensurate with the formulation of 2.12 with respect to the *Weltanschauung* hypothesis, and it bears directly on PROPOSITION IV.)

Consequently, SS-systems, since they are at least in the beginning construed as fictional constructs, are either consciously or nonconsciously used "as if" they were true generally without the need of the system's explicitly stating the fictional nature of itself. This "as if" nature is implied, like the "I am lying" paradox, at the level of the "secondary modelling system." That is, when *semions* and/or *symbols* are used implicitly to construct an "as if" reality, they are themselves the reference point of the statement containing them. Their linkage is also intrinsic, as are all SS-system constructs according to the model proposed in 1.21. That is, direct reference is internal. Only when for a particular individual the "as if" becomes "is" does external reference become direct. Then he is no longer aware of the implicit self-referentiality of his statements. The paradox exists at a nonconscious level. This is, of course, no big problem for one who only occasionally commits such an error when constructing/perceiving a metaphor, figure of speech, fiction, or scientific model. For the schizophrenic who "sees" a whole new world by a massive error of this sort, however, that's another story.

In sum, then, the use of SS-system entities is not separable from the conscious (and nonconscious) human mind which is capable of moving to higher meta-levels by means of self-referential semiotic discourse. NATURAL LANGUAGES are relatively limited by cerebral constraints, but the interdependency between NATURAL LANGUAGES and SUBLANGUAGES maintains both systems in a perpetual and dynamic state of openness.[4]

2.3 Fuzziness Between Boundaries

2.30 From our broadened vantage point it is now possible to describe informally a hypothetical model for the act of "stepping outside the circle" of a CF – and consequently of transforming the use of SS-system entities by means of a particular SUBLANGUAGE (a formal treatment of the phenomenon will be forthcoming in Part 4). Such description is necessary in order eventually to come to terms with conceptual change as it is constructed/perceived in texts.

2.31 *SS-systems, like CFs, are never wholly conscious for the user.* Consider Figure 5 (next page), which represents diagrammatically the cognitive possibilities for a given individual:

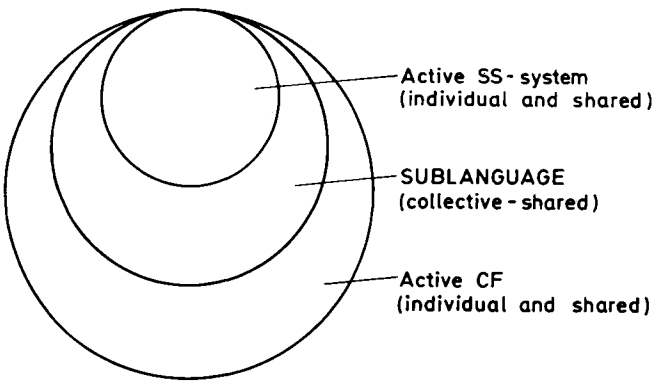


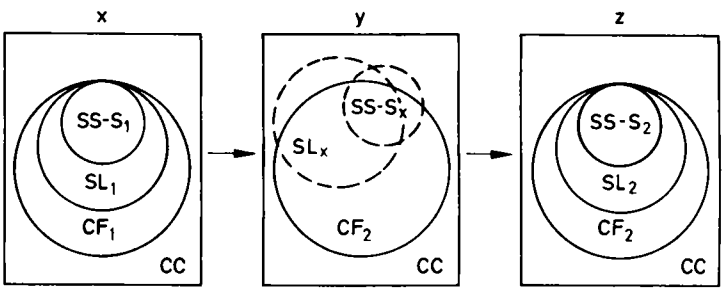
Figure 5

This, it will be observed, is commensurate with, indeed it is sort of a "subset" of, Figure 4. A SUBLANGUAGE is, as discussed above, the media used from within scientific, literary, philosophical, mythical, religious, etc. CFs to construct/perceive SS-systems in texts. The CF defines the range of conceptual possibilities within given parameters. Therefore it corresponds to the general world-view held by a subculture or a relatively homogeneous group of individuals across cultures: the Newtonian world-view in science, the Renaissance view of art, the Catholic religion, etc. However, a CF is not in its entirely active. Part of it is passive (embedded) and below the level of consciousness: a potential. The active portion of a CF is partly individual and partly collective in character. With respect to texts, the active portion of the CF governs one's particular perception and interpretation of a textual world elaborated with a given SS-system and by use of a SUB-LANGUAGE which in general is shared with others. Hence one's active CF determines the range of possibilities one possesses for "seeing" and articulating that external world on *semionically* conscious levels; that is, at the conscious level of the SS-system.

2.32 *Why a* Gestalt*-like CF "switch" is never at the outset complete.* However, it bears mentioning that the boundaries in Figure 5 are never as absolute as might be desired. "Stepping outside" one CF and into another occurs, according to the *Weltanschauung* hypothesis, in a "flash." It is the Archimedean "Eureka" effect. After such a *Gestalt* "switch," the newly conceived CF must be described by the use of figurative SS-system entities from a new SUBLANGAGE. But there will always be, due to the "semantic lag," certain archaic mental "imagery" (meanings). That is, whether

consisting of literary metaphors and artistic techniques, mythical and religious analogs, philosophical and historical world models, or more rigorous scientific models, the SS-system entities are at the outset invariably plagued by a degree of vagueness. They are not quite as explicit as desired, for there is a certain impreciseness that is difficult to remedy. And they are not exactly what the author had in mind, although they may come very close.

Hence, "Semantic lag" accounts textually for the fact that what one "sees" is invariably tinged with what one has "seen" in the past and with what one's cultural conventions, one's total form of life, dictates what one expects to "see." Nevertheless, the fact is that new worlds *are* "seen," boundaries *are* breached, new modes of description by use of novel SS-systems *are* forthcoming. Therefore one *is* able occasionally to "see" things in a different way. Such transformations of conceptual and perceptual modes can be illustrated by the following scheme:



(where SS-S denotes SS-system and CC denotes COGNITIVE CAPACITY)

Figure 6

A given subject realizes a *Gestalt* "switch" from (CF_1) to (CF_2). The set of SS-system entities ($SS\text{-}S_x$) he appropriates to describe and explain his newly acquired (CF_2) remains at the outset imprecise and "fuzzy." Moreover, the SUBLANGUAGES he uses is even "fuzzier" since it is still charged with traditional mental imagery (meanings). Only after a period of adjustment, when the "semantic lag" represented by the boundaries of ($SS\text{-}S_x$) and (SL_x) outside (CF_2) are gradually (but never completely) erased, is a new "equilibrium" established. Then the transformation is by and large effective from ($SS\text{-}S_1$) to ($SS\text{-}S_2$) and from (SL_1) to (SL_2).[5] However, holistic *Gestalt* "switches" are in reality rare, occurring only during the most "traumatic" moments of one's conceptual development. The ordinary form of change entails relatively mild "non-revolutionary" transformations during which time a given CF remains relatively intact. This will be the focus of 2.33.

2.33 *At a "surface level" SS-systems and SUBLANGUAGES are more dynamic than CFs.* Consider Figure 7:

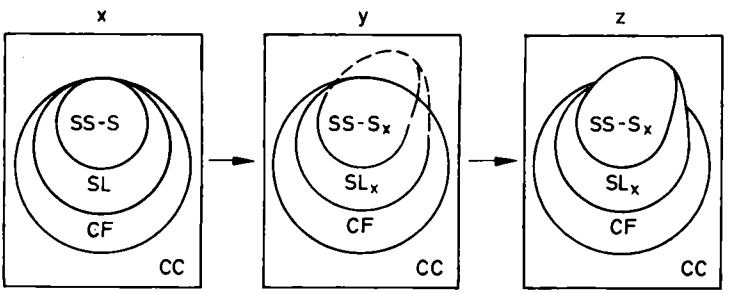
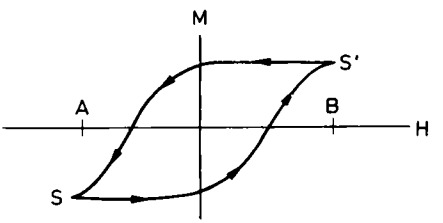


Figure 7

In this case part of the active portion of a subject's SS-system and SUBLANGUAGE extends beyond the ordinary boundaries of the (CF). That zone outside the (CF) now represents a potential not yet actualized. That is, the subject is able to articulate something by the use of revised or new SS-system entities without yet being aware of the full implications of what he articulates. In essence he says more than he (consciously) knows he says. As his level of awareness increases the (CF) is eventually subjected, according to the transformations illustrated in Figure 7, to a degree of "distortion" after which time a new "equilibrium" is established and the new domain is incorporated into what was the original (CF). (This is similar to Kuhn's "anomalies" which crop up and distort scientific "paradigms" and which are subsequently explained away by necessary "appendages" to the "paradigm.") On the other hand, such "distortions" may become "critical" in which case the new domain represented by the extended SS-system and and SUBLANGUAGE cannot effectively be incorporated into the (CF) and it is replaced by another radically distinct (CF) which is to a greater or lesser degree incommensurable with the first (as in Figure 6). In this case the second (CF) necessarily retains many of the axioms, propositions, inferential statements, commonplace phrases, stylistic devices, rhetorical modes, etc. used in scientific, literary, philosophical, mythical, and religious texts. However, most of the meanings or "mental images" connected with these terms will be different. (This latter example is similar to Kuhn's notion of the accumulation of "anomalies" in a given "paradigm" until it becomes dysfunctional and a "leap" is enacted to another "incommensurable paradigm.").

Two important observations follow. First, with respect to Figure 7, the zone in diagram (Y) where (SS-S_X) and (SL_X) have entered into part of (CC) outside (CF) is not simply the area representing a breach of the boundary of a given (CF) such that that portion of (SS-S_X) and (SL_X) is neither part of the (CF) nor is it articulable. It represents that part of the conceptual zone inside one's COGNITIVE CAPACITY, which at this point is only potentially and partially articulable. But it can later become more effectively articulated and finally part of the revised (CF). Second, whenever part of an (SS-S) and (SL) exists outside the conventional (CF) a "semantic lag" is inevitably in effect. A "semantic lag", whether in inter-(CF) "switches" (Figure 6) or in intra-(CF) change (Figure 7), can be illustrated by what is called in physical systems "hysteresis." If we apply a magnetic field to a ferromagnetic material, magnetization of the material "lags" behind the linear increase of the magnetic field. Then if we plot induced magnetization against the magnetic field applied we obtain an hysteresis "loop":



(where: H = magnetic field
M = rate of induced magnetization)

Figure 8

Initially the field is increased from (A) to (B). Magnetization "lags" behind along the curve (S → S´). If the field is decreased, demagnatization will follow the path (S´ → S). Although the "semantic lag" of a CF behind an SS-system and SUB-LANGUAGE (or vice versa) cannot be quantifiable in the sense of the hysteresis "lag" in physical systems, it appears that the two phenomena are analogous.

In the next two subsections I will illustrate how a delayed "semantic lag," like the hysteresis "loop," can and has occurred.

2.34 Radical *Gestalt* "switches" from one CF to another produce a "semantic lag" between the new CF and the old SS-system and SUB-LANGUAGE: two examples.

The "switch" from Newtonian to Einsteinian physics entails a new world-view which is most probably only now beginning to realize its full effect on

Western World societies. (It must be recalled that the social impact of the Copernican Revolution occurred over a few centuries, and we are still feeling the effects of the Darwinian Revolution.) Consider, for example, one particular term which was retained from Newtonian physics: "atom." The "atom" was considered to be corpuscular in nature during the reign of Newtonian physics, but after the advent of quantum mechanics it was finally conceived as having complementary "particle-wave" characteristics. The problem is that the term "atom," since it has not changed morphologically, tends to force one, according to Capek (1961), into conventional patterns of mental imagery. That is, "particles" and "waves" were certainly not alien to the Newtonian view of the universe, but their combination into one hyphenated word does not do justice to the radically new scientific concept lying behind them (see Bachelard, 1963; Jeans, 1933; Whitehead, 1948). Interestingly enough, it was once rather ironically proposed that instead of "particle-wave," a new term, "wavicle," should be adopted. This would entail the creation of a completely new SS-system entity which might in some conceivable way help to establish the desired "equilibrium" between a new CF and the incomplete, inconsistent, and "fuzzy" SS-system and SUBLANGUAGE. If and when this might occur the "semantic lag" between the CF and the SS-system-SUBLANGUAGE could be appreciably reduced.

Chomsky's argument for a "rationalist" approach to linguistics has been effective. However, his appeal to tradition by equating his hypothesis with that of the Port-Royal linguists and with Cartesian philosophy contains a few inconsistencies (see, for example, Cooper, 1975; Robinson, 1975). To mention only one, Chomsky's "innateness hypothesis" does not entail *innate ideas* in exactly the Cartesian sense, but an *innate capacity* to speak. And this capacity, at the outset at least, refers almost exclusively to syntactic structures. Hence "rationalism" and "Cartesian linguistics" are two supposedly traditional terms appropriated as SS-system entities in a new CF, but the meaning of these terms is still vague, inconsistent, and tied to conventional mental imagery. Perhaps when among Chomskyan linguists new meanings are applied to some of the key terms used in SS-systems and text systems the "semantic lag" in this case may also be reduced.

2.35 "Non-revolutionary" changes produce a "semantic lag" between SS-systems, SUBLANGUAGES, and their corresponding CFs: the examples continued.

Neither SS-systems nor the SUBLANGUAGE has become crystallized in the Einsteinian world-view (though there appear to be signs that it is rapidly moving in that direction [Bohm, 1957; Feyerabend, 1975]). From within this framework a new set of SS-system entities, to give only one example, "quarks," was invented in an attempt to explain the existence

of a confusing array of subnuclear "particles" that have been detected. The fact is that, as far as I know, "quarks" have not definitely been verified empirically, although there seems still to be some hope that they will be in the near future. At this time the term and the concept represent no more than a vague extension of a relatively accepted CF. If "quarks" are "verified," then the CF may perhaps be "expanded" definitely to include the new term and its concept, and the corresponding SS-system and SUBLANGUAGE will become further crystallized. Subsequently, movement toward a new "equilibrium" will help to erase the present "semantic lag."

As mentioned above, the early stages of the Chomskyan hypothesis postulated the autonomy of syntax. Subsequently, Katz and Fodor put forth their semantic theory, and shortly thereafter Chomsky incorporated semantics or meaning into his theory. However, there have since been various proposed radical revisions of Chomsky's broader hypothesis by the "generative semanticists" (see Steinberg & Jakobovits, 1971). However, by and large the original hypothesis of "rationalism" has not been tampered with. That is to say, such SS-system entities as "generative semantics" have appeared, but at this point these entities have not been effectively incorporated or rejected from within the (as yet rather vague and ill-defined) public CF.

These are rather simplified examples. Others could be cited such as new theories in the social sciences, historical revisionism, new "schools" and movements in the arts, and radical changes in religions, etc. Yet all such examples potentially lend themselves, I believe, to detailed analysis in light of the model I am constructing (see Appendix I, for further comments). For the moment, nevertheless, limited time and space demand that we continue with the central theoretical interests of the present inquiry.

2.36 I hope to have demonstrated in Part 2 that: (a) all relatively sophisticated and relatively complex texts portray (albeit incompletely) a CF, (b) this CF is manifested implicitly and explicitly by means of SS-systems, from the "atomic" level of individual statements to the broad "macromolecular" level where the text is constructed/perceived as a holistic entity, and (c) CFs are subjected to "evolutionary" change or "revolutionary" displacement, but there exists inevitably a "semantic lag" such that the transitions are never complete.

In Part 3 I will continue inquiry into the creative process of SS-system and text system construction/perception, while developing further the alternative to the *Weltanschauung* hypothesis.

Notes

1. According to Kuhn's version of this hypothesis, all great scientific theories have developed out of a new pattern of thought, or a paradigm, which leads to the construction of a particular view of the world. Within a given paradigm scientists engage in "puzzle-solving" activity by following an established set of rules and by accepting on "faith" a given set of axioms, propositions, and inferences. However, "anomalies" gradually appear in the paradigm. At first they are successfully explained away by auxiliary "appendages" to the paradigm, but accumulation of these appendages leads to an increased number of problem situations. Finally, by means of a *Gestalt* "switch," some rather disenchanted member of the scientific community is "converted" to a radically distinct paradigm, and if he adequately proselytizes his newly found "faith," that paradigm may become generally accepted by the community.
2. Compare what I have suggested thus far concerning conceptual frameworks, SS-systems, and the "macromolecular" level of texts with van Dijk's (1972, 1977a, 1978) notion of "macro-structures." A textual "macro-structure" is the "global organization of the semantic structure of a discourse" which organizes "both the production and the comprehension, storage and recall of complex verbal structures" (van Dijk, 1978, 64). Following the psychologist Kintsch (1974), he goes on to say "that discourse comprehension is semantic, propositionally based, and that surface structure complexity only influences understanding under specific reading time restrictions. Important is the experimental confirmation of the assumption that all processes involved in discourse understanding, question answering, problem solving, recall and recognition, etc. are not only based on those propositions which are explicitly expressed in the discourse, but also on those which are deductively or inductively implied by expressed propositions. That is, discourse comprehension has an important inference making component" (van Dijk, 1978, 64). I intend to demonstrate precisely that this "inference-making component" is an integral part of a general cognitive mechanism which governs the organization of conceptual frameworks by means of which SS-systems and texts are constructed/perceived.
3. It bears mentioning that Chomsky (1975) suggests the possibility that language and grammar rules react with "cognitive systems" (i.e., systems of knowledge and belief, including artistic constructs) to determine how sentences will be generated and interpreted. He sets up three levels of knowledge: knowledge of grammar rules (pertaining to NL), "common sense" knowledge (similar to N and O), and explicit knowledge such as knowledge of physics (similar to SS-systems generated from an SL). Chomsky suggests that there may be:

   > striking differences between these systems. Knowledge of physics is conscious knowledge; the physicists can expound and articulate it and convey it to others. In contrast, the other two systems are quite unconscious for the most part and beyond the bounds of introspective report. Furthermore, knowledge of physics is qualitatively distinct from the other two cognitive structures in the manner of its acquisition and development. Grammar and common sense are acquired by virtually everyone, effortlessly, rapidly, in a uniform manner, merely by living in a community under minimal conditions of interaction, exposure, and care. There need be no explicit teaching or training, and when the latter does take

> place, it has only marginal effects on the final state achieved. To a very good first approximation, individuals are indistinguishable (apart from gross deficits and abnormalities) in their ability to acquire grammar and common sense. Individuals in a given community each acquire a cognitive structure that is rich and comprehensive and essentially the same as the systems acquired by others. Knowledge of physics, on the other hand, is acquired selectively and often painfully, through generations of labor and careful experiment, with the intervention of individual genius and generally through careful instruction. It is not quickly and uniformly attained as a steady state, but is transmitted and modified continually on the basis of controlled inquiry and an explicit record that provides the basis for the next stage of construction (Chomsky, 1975, 144).

Note the similarity between Chomsky's statement and my formulation. The principle distinction is that I believe that a clear-cut distinction between scientific and non-scientific, or objective and subjective, knowledge is not possible.

4. In this respect, I believe that Feyerabend refers to what I call SUBLANGUAGES although he does not explicitly make the distinction between SUBLANGUAGES and NATURAL LANGUAGES. Let me illustrate. Feyerabend (1975, 163-64) points out how Copernicanism clashed with what were assumed to be obvious facts; it went against well-established principles and did not fit in with the "grammar of a commonly spoken idiom," In other words, a new "world-view" was asserted which remained outside the "grammatical rules" of acceptible science. Such "grammatical rules" govern the normal "form of life" in which the scientists are engaged in their activities, and which is characterized by the conservative attempt to maintain a closed system and defend it against all contradictory (i.e., "false") alternatives. Feyerabend's "grammatical rules" come by way of Whorf's (1956) hypothesis that languages do not only describe events, they shape events and therefore classify perceptual phenomena. These classifications are covert, they differ from language to language (which accounts for linguistic relativism), and they are internalized and used by a member of a given speech community in such a way that they later become "frozen" in his mode of organizing perceptual reality and giving meaning to the world. For Feyerabend, Aristotelian physics, classical mechanics, and modern relativity are "languages" (SUBLANGUAGES) in the Whorfian sense. They were formed only after penetrating and deconstructing previous scientific "languages" at the level where covert classificatory systems rests, and then constructing a totally new "language." Therefore it seems that Feyerabend is implicitly referring to something similar to what I call SUBLANGUAGES, not NATURAL LANGUAGES. New "languages" (SUBLANGUAGES) of science, literature, philosophy, myth, religion, etc. whose nature could not be foreseen and whose appearance was unpredictable, can be constructed and added to the growing repertoire of existing SUBLANGUAGES, which are in turn included within the domain of NATURAL LANGUAGES and which, with their inherent incompleteness and inconsistency, provide openendedness while they remain bound to LINGUISTIC CAPACITY.
5. A certain degree of "fuzziness'. is inevitably the case even in scientific theories (Bridgman, 1959; see also de Broglie, 1939, & Planck, 1936). Bridgman, for example, contends that logical systems as simple as the syllogism can be relatively successful, but in some complicated systems such as scientific theories "fuzzy areas" inevitably crop up to render impossible strict either-or interpretations. As a result, inconsistencies arise which cannot be resolved from within the

axiomatic base at the heart of a given system. The same is true of any other cultural system where vagueness, ambiguities, inconsistencies and anomalies are unavoidable. Either-or solutions provide a handy conceptual tool but are never powerful enough to erase the "fuzzy areas," especially when applied to real life situations.

Linguistic categories also manifest properties of "fuzziness" on a microscopic scale. Early "generative semanticists" operated on the assumption that the concerns of linguists and orthodox logicians were consistent with each other (for instance, McCawley, 1971). It is now conceded by many, however, that concepts described in natural languages have "vague boundaries and fuzzy edges." Truth conditions for natural languages cannot be limited to true, false and nonsense, for boundaries are indefinite and arbitrary.

Lakoff (1972), observing that "category membership is not simply a yes-or-no matter, but rather a matter of degree," applies many-valued "fuzzy" logic to linguistic categories. And, Ross, 1972) discusses what he calls "squishiness": syntactic entities which have traditionally been considered discrete categories but which in reality possess no absolute boundaries. Categories merge into one another. They are "squishy." If Lakoff's and Ross' arguments are valid, then it seems to follow that our language and by extension our SS-systems, SUB-LANGUAGE, and CFs, are a conglomeration of "fuzzy" and arbitrarily drawn boundaries. The underlying aspect of our knowledge of culture-world is continuous; only the surface possesses the initial appearance of discreteness. This supports the notion suggested above that semantics cannot be categorically independent of pragmatics. We must move into real-world situations, away from "dictionary knowledge" of language and in the direction of culture-world knowledge.

PART 3

How We Perceive Texts: Steps Toward an Alternative Model

Whatever we suppose to be the totality of propositions, statements about this totality generate new propositions which, on pain of contradiction, must lie outside the totality. It is useless to enlarge the totality, for that equally enlarges the scope of statements about the totality.

Russell (1956, 62)

In general, the objective of Part 3 is to postulate, and then informally to illustrate: (a) two universal substantive properties inherent in all relatively sophisticated and relatively complex texts, and (b) how, with respect to these two properties, texts can be read from within diverse perceptual modes.

3.1 The Paradoxical Imperative

3.10 Consider the following, which concerns the first of the two universal properties to be discussed in Part 3:

PROPOSITION VI: At the roots of all relatively complex and relatively sophisticated texts lies a *paradoxical* (or *contradictory*) *base.*

The textual contradictory or paradoxical base inherent in SS-systems and texts is commensurate with PROPOSITION V and with the self-referential, and therefore ultimately inconsistent, nature of all closed systems as put forth in PROPOSITION IV (and as outlined in DEFINITIONS 2-II through 2-IV). In 3.11-3.14 I will use thought experiments to illustrate the general nature of paradox, and then I will turn specific attention to the problem of diverse modes by means of which we perceive texts.

3.11 *Human knowledge is edified upon paradox.*[1] Whitehead (1948, 167) tells us that: "In formal logic a contradiction is the signal of defeat; but in the evolution of real knowledge it marks the first step in progress toward victory." But the problem is that knowing is by its very nature

paradoxical. To know is to be, in the human sense, conscious, and conscious of consciousness. On knowing, we become conscious of the object of our knowledge and of our-self. We acquire a state of consciousness and our-self in this way transcends the object of knowledge. But the self, on knowing, is also inextricably a part of the object of knowledge, and the self is therefore incapable of transcending that of which it is a part. But if there were no transcendence there could be no knowledge at all, for the capacity to transcend that which we know is essential to us – the knowers.

In addition, if, according to the assertions in Part 2, every CF, SUBLANGUAGE, and SS-system, is incomplete and/or inconsistent, then each perspective of all or part of the world must either inherently, or from some other perspective, incorporate those same characteristics. I believe this to be precisely the case. From a historical perspective we must admit the validity of this rather disconcerting fact. Looking to the past, every philosophy, scientific theory, advanced culture which has fallen into decay, social, political or economic system, can be demonstrated to contain somewhere, at some point in time, a flaw – at least from our present, and biased, view. Future civilizations will certainly look upon us in their own "prejudiced" way as well. Consequently, since every CF is by and large culture-bound, *Weltanschauung*-bound, and language-bound, then every relatively complex and relatively sophisticated text, portraying part of a particular CF, will inevitably, from a distinct perspective, contain a "flaw" in common with that CF (i.e., it will inevitably be the *incomplete* representation of a/the world, and it will, at some point and from some perspective, be *inconsistent*). The notion of contradiction or paradox in texts is, then, keyed to broad cultural perspectives.

Three types of paradox, arising from contradictions, must be distinguished before we can proceed:

(a) *Logical* or *mathematical,* consisting of a contradiction arrived at by the conjunction of a set of principles which by themselves are non-contradictory (the Russellian paradox: classes of things cannot be members of themselves).

(b) *Semantic,* which differs from the first in that it arises out of a hidden inconsistency at the level of human communication and thought (the Cretan paradox, which is in a more abstract sense the Russellian class-member confusion).

(c) *Existential* or *pragmatic,* which involves a subject (i.e., the text constructor/perceiver, or in the literary text the character, narrator, actor, etc.) who intentionally or unintentionally asserts something referring to the context of human existence which conflicts with certain culturally imposed categories of meaning and behavior, and in attempting to

satisfy both his or her own desires and cultural conventions he or she is placed into a closed system of quandaries from which, from his or her perspective, there is apparently no escape.

The following discussion focuses on paradoxes of the semantic and existential or pragmatic type. It must be kept in mind, however, that these paradoxes are ultimately derived from logical contradictions (see Bateson, 1972; Watzlawick, Beavin, & Jackson, 1967; Wilden, 1972).

3.12 *Paradox ultimately and invariably involves frames of reference.* To speak of frames of reference is impossible in this context without reference to the distinction between "digital" and "analog" systems.

A digital system is that of the digital computer (or abacus, calculator, adding machine, etc.) which reduces messages to discrete binary "bits" along a discontinuous scale with precisely defined boundaries between units. An analog system, like the analog computer (or slide rule, thermometer, etc.) consists of a continuous scale with no precisely defined parts. For instance, using a slide rule one must sacrifice accuracy, but one can view the entire scale as a range of possibilities for all future calculations. Using a pocket calculator one enjoys precision, but one can view no more than a few digits at the same time; the entire system is not available for observation. However, this digital/analog distinction, even when considering machine-generated languages, must be used with caution (see Goodman, 1976; von Neumann, 1958: Wilden, 1972). The digital computer operates with a binary code, but when considered as a whole, even a code is an analog since it is "analogous" to that which is being codified. We must keep in mind that the distinction between digital and analog communication depends on the way it is used in particular circumstances.

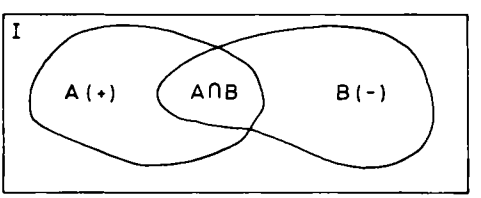
Systems of human communication are neither purely digital nor analog. It does appear to be the case that the coding devices employed in verbal communication are vastly different from our paralinguistic codes (i.e., iconic signs, and olfactory, auditory, gustatory, and tactile images). Paralinguistic communication is by nature primarily analogical. Moreover, there is striking resemblance between human paralinguistic systems and the analog systems of animal communication: both come in "whole" messages (Bronowski, 1967). Human speech, on the other hand, is primarily digital. Nevertheless, it is not devoid of analog characteristics: although human speech rests on a digital code at the phonemic level, at higher levels it manifests both digital and analog properties (Sebeok, 1962). Hence there is no all-or-nothing distinction between linguistic and paralinguistic forms of communication with respect to the digital-analog contrast. Yet language systems are unique in so far as they entail an interrelationship between both modes. Messages generated linearly and over time from a digital code can be interpreted

analogically and holistically as an interconnected fabric of signs by means of culture-world knowledge at the level of the "secondary modelling system." In this sense human language is a remarkably sophisticated system the defining characteristics of which are not found in our paralinguistic systems or in any system of animal communication (Altmann, 1962; Bronowski, 1967; Bronowski & Bellugi, 1970; Brown, 1970; Hockett, 1959; Sebeok, 1968).

Analog and digital modes usually interact to a greater or lesser degree in many forms of conception and perception. To give a simple example, a holistic image such as a photograph or a caricature is nondiscursive and pictorial. It is displayed rather than described and it resembles its subject, therefore it is an analog. We perceive it instantaneously and synthetically in *Gestalt* fashion. However, at the same time we usually "analyze" it to a greater or lesser degree when perceiving it. In this process it is "digitalized." That is, we focus on some of the "bits' of the analog image, separating them out and classifying them at conscious as well as tacit levels.

It follows that the analog and digital modes also interact in textual construction/perception to form a complementary whole. SS-systems in texts require alternatively both analog and digital perception. Texts are perceived "bit" by "bit" (or digitally) in a linear fashion, while simultaneously holistic (analog) images are being (re)constructed. What is the general (analog) image underlying a poem, the set of axioms at the base of a mathematical theory, the model upon which a scientific explanation is constructed, the cosmological view immanent in a religious text, or the "root proposition" which guides a historical work? These holistic and rather instantaneously conceived images cannot be communicated equally instantaneously in the text but only by means of a digitalized code system (a natural or artificial language) which is perceived through time.

With this in mind, consider Figure 9:



(Where I = Conceptual Universe)

Figure 9

Let (A) and (B) represent separate analogs, or holistic images whose connotation is positive and negative respectively. That is, assume that the first possesses "desirable" attributes for a particular perceiver, while the attributes of the second are "undesirable." In this sense, the area (A ∩ B)

is negative if included within (B) and isolated from (A), and it is positive if included within (A) and isolated from (B). But this is impossible since the parts of the total analog system cannot be abstracted from the whole without partly "digitalizing" it. Then it might be said that the overlapping area can be looked upon as intermittently both positive and negative. It constitutes a "liminal" or "fuzzy" zone between the two analog domains. Leach (1964, 1976) shows how in human cultures categorical oppositions are established wherein there inevitably exist such "fuzzy" areas. These contradictory zones in the meanings of words and in general concepts are responsible for social taboos: that which is unthinkable, unspeakable, undemonstrable. They are consequently repressed because they confuse the neatness of the boundaries that have been established in a given culture.

Figure 9, in addition, represents the beginning of a series of digital differentiations between what were originally two incommensurable analog wholes. For example, (a) and (B) belong to different analog levels, but to move from one level to the next requires a discontinuous digital "leap" by way of the mediating zone, (A ∩ B). (Cybernetic theory shows that digitalization is always necessary when communication crosses from one system to another.)

However, since the "liminal" zone represents at the same time a continuity which is neither (A) nor (B) but, intermittently, both (A) and (B), it is the beginning of a more broadbased continuous and holistic, entity capable of including at once, though contradictorily, both (A) and (B). Hence it can be considered as part of some other system, a meta-system at yet a higher level. From within this higher system, which includes (A ∩ B), both (A) and (B) can be perceived by means of oscillation from one to the other. Like the figure/ground of the *Gestalt* diagram, or like Wittgenstein's "rabbit"/"duck" drawing, two contradictory wholes can be intermittently juxtaposed from within a larger conceptual framework.

3.13 *Overlapping boundaries between two incommensurable wholes can serve to mediate a contradiction.* Notice what occurs in Figure 10:

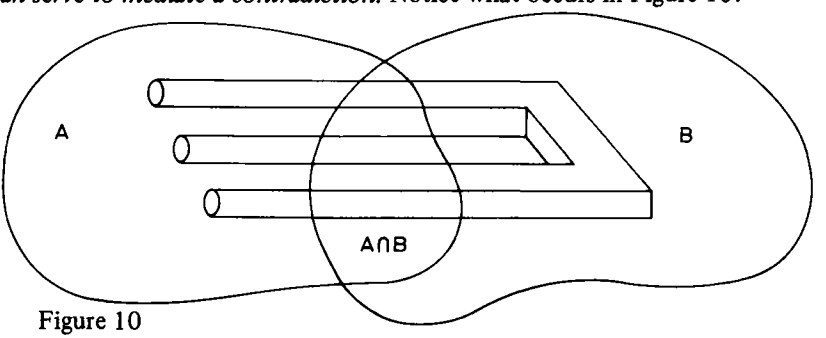


Figure 10

That portion of the drawing in either (A) or (B) is "rational." (B) is constructed by means of "rectangular" organization, (A) by "cylindrical" organization. (A ∩ B) can be conceived alternately as part of either one or the other. (A) contradicts (B), but perception from within either of the two "worlds" is non-contradictory. (A ∩ B) does not pertain exclusively to either mode of perception, hence it is "liminal." However, the view from "above" of the entire drawing is "irrational."

Of course, upon viewing this "paradoxical" drawing for the first time we try to perceive it as if it were orderly and "rational." But when forced to view both perspectives, (A) and (B), our effort to perceive it as an orderly system is subverted. Yet in face of the paradox we become aware of something new, of something we had not expected. A problem situation is now before us which we immediately attempt either intentionally or unintentionally to resolve so that we can renew our existence in an orderly system (see also Merrell, 1982).

Riddles and their solutions can also be illustrated by means of the same type of overlapping but contradictory frames (see also Maranda, 1971). Take for example this one, popular with children:

(1) What is black and white, and re(a)d all over? – a newspaper.

What occurs when we hear the riddle, that is, assuming that at the outset we did not know it was to be a riddle? The sentence string begins, and we perceive the words black, then white, then "red." After perceiving the first two words we set up what we believe to be the proper expectations. As the sound pattern equivalent to "red" reaches us we "logically" expect it to be compatible with the images that have been set up with respect to the first part of the utterance. But, then we become aware, from a meta-level, of the contradictory situation. Meaning for the sound pattern denoting "red" does not fit into the framework containing "black" and "white" we had tentatively inferred since nothing can be non-contradictorily black, white, and "red" all over. The two frameworks are therefore perceived as "logically" and semantically contradictory. Hence, we must re-evaluate our original hypothesis, formulate another, test it against the sound pattern we perceived, and construct a new hypothesis capable of resolving the contradiction.

Of course, resolving the riddle involves consciousness of the two possible meanings of the homonyms "red" and "read" from above, from within a meta-framework. Let us construct two contradictory classificatory systems and place the two meanings of the ambiguous term in the "liminal" zone (see Figure 11, next page):

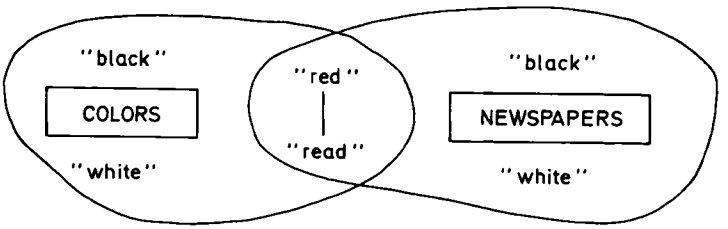


Figure 11

Epistemologically, such "liminal" zones can provide, on broad conceptual levels, for alternating perspectives by means of which it is possible intermittently to perceive Newtonian *and* Einsteinian physics, "primitive" *and* "modern" world-views, or Christian cosmological frameworks *and* Oriental mystical frameworks. This is comparable to Feyerabend's external vantage point from which relatively incommensurable CFs can be viewed. It is also inextricably contradictory, or even paradoxical. Moreover, the security derived from remaining "inside" one apparently conistent whole is lost when the paradox is revealed and one is forced to "see" the larger system from "above." This is why, as Leach tells us, the paradoxical "liminal" zones constitute taboo areas. And this is why, as modern psychiatry demonstrates at the individual level, the schizophrenic slips into a socially unacceptible mode of perception in order to escape the paradoxical situations confronting him (Laing, 1965). We ordinarily prefer to remain in the domain of sub-wholes each of which are inherently "rational" even though they become contradictory when viewed from "above." In other words, our CFs allow us to organize our items of experience into orderly and what for us are usually non-contradictory pigeon-holes. However, the human mind is, of course, also finite, and fallible. It might be aware of paradox at tacit levels even though not at conscious levels. And sometimes this tacit level paradox can effect our conception/perception of our world (Bateson, 1972) (cf. above, 2.22).

3.14 *Construction/perception of contradiction-paradox in texts.* In view of Gödel's inconsistency/incompleteness theorems (DEFINITION 2-IV) and Russell's "logical types" (DEFINITION 2-III), and from the notion of CF, SS-system, and SUBLANGUAGE "switches" as outlined in 2.32 and 2.33, consider the following:

COROLLARY I: Novelty in texts is the result of conscious or nonconscious alteration of categories which were previously considered to be "rational," or at least potentially "rational."

COROLLARY II: Such alteration of categories potentially results in awareness of category mistakes, contradictions, or paradoxes.

Following these corollaries, the question toward which the remainder of this section will be directed is: How can this alteration of categories be informally described?

Consider the literary text. This type of text obviously entails nonconscious construction/perception of textual SS-systems to a greater extent than other types. An interesting aspect of prose fiction and drama is first that the literary characters themselves can portray, at tacit and nonexplicit levels, contradiction and paradox, and second, that this contradiction and paradox can be implicit at the underlying "macromolecular" level. In this respect, Slaatte (1968) observes that in all outstanding literary works from Aeschylus, to Shakespeare, to Ibsen, Strindberg and Dosteovsky, the relations of paradox to the tensions of human existence are revealed.

A good example is the case of Juan Pablo Castel in the Argentine writer Ernesto Sabato's *The Outsider.* Castel is alienated in the typical existentialist sense, unable to communicate with the larger society. Then he meets Mária Iribarne, the one person which whom he believes communication to be possible. However, soon he arrives at the point where her every word he construes to be potentially a lie, but at the same time he willingly admits that she might possibly be telling the truth. He tries, by means of what he believes to be logical inferential reasoning, to prove simultaneously that she deceives him and is honest with him, that she is and is not a prostitute, that she loves him and does not. Often he interprets her literal statements as metaphors and her figurative statements literally; that is, he confuses boundaries and categories of thought. Consequently from his limited perspective he can find no definite answers to his problem. Unable to decide, he oscillates between the *either* and the *or.* To believe Mária brings commitment, and he loses. His only truly positive act is a negation of his only hope: he kills Mária. Now, in prison, his freedom is nullified anyway. He sits down and writes his story, a self-reflexive act, the ultimate state of alienation and solitude, wherein he communicates only with himself, if at all.

Of course, in *The Outsider* the paradoxical situation is quite obvious. In other texts, literary or whatever, contradiction or paradox is of different types, ranging from logical to pragmatic, and it is generally not so evident (as well shall see in 3.5 and 3.6).

3.15 *What constitutes the reader's perception of the contradictory-paradoxical aspect of the literary text?*

First, *there must be potentially an element of surprise,* the jolt of re-

cognizing something not before known. This stems from the novelty inevitably present to a greater or lesser degree in all texts. But what in a text constitutes potentially a unique perception of a given espect of the world may lie below the level of the reader's consciousness: embedded *symbols* and *semions.*

However, there must exist a minimal level of awareness before the contradictory or paradoxical base of a text can be perceived. Becoming aware requires that one possess a set of expectations that the world will be such-and-such a way (Popper, 1972). Then, when some aspect of the world is incompatible with those expectations, one can become aware upon discovery of that incompatibility. In this sense, we must *know* before we can *expect,* and we must *expect* in order potentially to *discover* that we *knew not,* and discovery *that* our knowledge was erroneous entails *surprise* (Bruner, 1957).

We can be surprised in many ways on perceiving the literary (or any other) text. Most surprises are trivial; some are earth-shakingly profound. Puns, simple riddles, jokes, and certain ambiguities surprise and entertain us. But our intellectual or aesthetic interest in them wanes when we discover that the apparent contradictions or paradoxes were only false alarms. Semantic paradoxes and pseudo-paradoxes cause surprise, but the initial perplexity dissipates when we realize that they are not so serious as supposed. However, discovery of antinomies and some logical paradoxes compel us in rare moments to transform our view of the world, placing us in a new CF. When this occurs, our knowledge is now something radically other than what it was, and hence our expectations and our awareness are different. We are now potentially ready for an entire new set of surprises.

The problem is that, in addition to our penchant for constructing/perceiving change in texts, we have an opposite tendency to resist novelty, inhibited as we are by our set of cultural conventions. In time perhaps we might be able to get used to radical changes and find the new schemes we discover to be "natural" rather than "irrational." Human nature being what it is at present, however, novelty and surprises which entail new problem situations are customarily avoided when possible, or they are brushed aside as being irrelevant. Yet the fact remains that what was paradoxical last year may be today's logic, and what is today's logic may be next year's paradox. It is significant in this respect, though it should not really surprise us, that "the doctrine that the earth revolves around the sun was called the Copernican paradox, even by the men who accepted it" (Quine, 1962).

The second aspect of the reader's potential perception of paradox in literary texts is more complex. At the very outset *the reader is primed by a paradoxical situation on approaching the fictional text.* Consider reader

response to literary texts in the light of Coleridege's "willing suspension of disbelief." This phenomenon requires that we the readers first be capable of conscious disbelief before we can willingly suspend disbelief. Then we perceive the text "as if" it were real while supposedly maintaining awareness of the boundary separating what is "inside" the textual world from what is "outside."

In this light, Holland (1975, 71) tells us that: "Paradoxically it is our suspension of disbelief and the pleasure which results therefrom that makes literature, not the literariness of a given writing that makes us suspend disbelief." Willing suspension of disbelief in this sense is a voluntary act. Supposedly, then, when we suspend disbelief we perceive in the text an imaginary world "as if" it really existed. In a sense it exists because we conceive it as constituting part of a fictive world. For instance, it could be contended that even to talk about such a fantastic world as, say, a "square circle" implies, by the mere fact that we are using the words, that a "square circle" has a certain kind of existence. It exists in a logically impossible but fictively possible world (see, however, Quine, 1953).

But if we talk *about* a "square circle," we may come to say that it has no referent either in the objective material world or in the imaginary world of logical formulations, but that it can exist only in a fictive world of art. Therefore, we exclaim with triumph that a "square circle" is not necessarily real, that it does not really exist. But, on so speaking we have automatically suspended our suspension of disbelief with respect to the imaginary construct. As such we are no longer participants *in* the fictive but logically impossible world. We are now spectators *of* two worlds, the fictive world and the "real" world. This is necessarily so since we are now comparing one to the other. Inside the fictional system, disbelief suspended, all objects, even "square circles," can exist. Outside the system, non-reference of these purely imaginary objects can be stated, but suspension of disbelief has vanished. We can either suspend disbelief and all terms in the system become for us self-reflexive and "as if" they are "real," or we can perceive non-referentiality in the terms in a work of art from without, but we cannot do both simultaneously. Yet we *must* disbelieve or the literary text will be perceived as the "real" world; at the same time we *must* suspend disbelief in order properly to perceive the fictional text.

In this sense the process of reading the literary text involves, by the fact of its existence, paradox: an oscillation from one voluntary mode of perception to another incommensurable mode without the possibility of a solution, since they are mutually exclusive. This process is tantamount to accepting, in a tacit way and with respect to the textual boundaries, the statement in Figure 12. (next page).

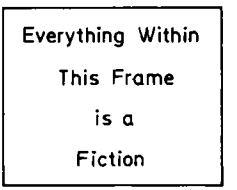


Figure 12

If the statement is itself a fiction it is true and hence it is not a fiction. If it is itself a true statement it is not a fiction and hence it is false. Therefore the statement is a fiction if, and only if, it is not a fiction, and it must be simultaneously believed and disbelieved – a contradictory situation leading to the oscillation from one perceptual mode to the other (see also Merrell, 1976a, 1978b, 1980a, 1982, 1983).

In our physical world what we accept as "real" we are compelled to believe and what is not "real" we disbelieve. On the other hand, concerning the world we put ourselves in when perceiving the literary text, our conscious disbelief and our willing suspension of disbelief oscillate between "inside" and "outside." To suspend disbelief we must enter the text system, become a part of it. Yet the suspension is voluntary, and we must somehow be at the same time "outside."

Sometimes it is possible to get totally carried up in the work. In such cases awareness of *self* momentarily and radically diminishes, and the boundary between "inside" and "outside" blurs. For instance, Lotman (1976, 18) tells us that: "At the dawn of cinematography moving images on the screen aroused a physiological feeling of horror in the audience (shots of an onrushing train) or physical nausea (shots taken from a great height or with a swaying camera). "The audience did not distinguish emotionally between the image and reality." Their "as if" modality suddenly became "is."

3.16 *Readings of texts from within scientific or religious CFs also require suspension of disbelief.* But the perceptual mode is in these cases inverted, for from within scientific and religious cosmologies we usually *involuntarily suspend disbelief.* It might be stated that, when reading scientific and religious texts, and to paraphrase Holland: "It is our *a priori* suspension of disbelief and the security which results therefrom that makes the text true, not the truthfulness of a given text that makes us suspend disbelief." Inside a given scientific or religious community our notion of what to believe and what not to believe is by and large predetermined. Our faith in a given set of assumptions continues unchanged as long as we can cram

our sensory world into a Procrustean bed which consists of boundaries automatically assumed to be "real." We do not ordinarily consider them to be conscientiously drawn in the beginning by some predecessor (i.e., shaaman, king, priest, pastor, scientist, college professor, god, etc.) through some concomitant *willing suspension of ontological disbelief.* Since we did not originally "think" these boundaries we are generally incapable of "thinking" beyond them, nor can we ordinarily "see" and "say" what lies beyond. This is how the Newtonian-Cartesian paradigm, in its inception an "as if" hypostat, could become dogma, blindly accepted on faith as a grandiose set of truthful propositions with which to describe all aspects of the universe.

This nonconscious or involuntary suspension of disbelief found in religion, ritual, myth, scientific paradigms (in the Kuhnian sense), etc. allows certain phenomena to be taken seriously which in another context would likely be dismissed. Moreover, nonconscious or involuntary suspension of disbelief from within a given cosmology can also be what I called in previous sections part of our tacit knowing, our culturally embedded knowledge.

It must also be admitted that ontological conditions such as belief, faith, doubt, skepticism, conversion, suspicion, etc. are likewise involuntary (see Wittgenstein, 1970). Who can predict a "leap of faith" or a "leap out of faith"? Does one intend to make the "leap" before it actually occurs? Does one decide to be skeptical before skepticism overtakes one?

Consider these imperatives:

(2) Go fetch the stick.
(3) Jump over the fence.
(4) Get out of here!
(5) Be spontaneous.
(6) Believe in God.
(7) Doubt your belief.

Commands (2)-(4), involving direct reference to the objective world, are voluntary actions which human beings and certain animals can equally obey. In contrast, (5)-(7) involve no object-language. They place the recipient of the command in an untenable position since they are involuntary activities. If you consciously try to be spontaneous it is not true spontaneity and if you are being spontaneous naturally you cannot consciously obey command (5). Either way you lose. Moreover, this self-reflexive quandary is distinctly human; I might tell my dog to fetch a stick but to tell it to be spontaneous is absurd, for we would suppose that it does not know how to be otherwise.

If, from a given belief system, we are "converted" by a "leap of faith" to a new belief, our new world now becomes the only "true," "real," or valid world. This new world is not necessarily devoid of self-reflexivity, or

paradox. Yet we can gradually become embedded in it such that the contradictions and paradoxes inherent in it are construed as mysterious forms of truth, or ambiguity is taken for lucidity, self-reflexivity for freedom, metaphorical statements for literal and literally true statements, etc. As Laing (1969) points out, the deeper social conventions are rooted in use, the more like "natural laws" they come to appear to us. It all becomes a monstrous *knot* into which we are tied without knowing it. In this sense what we take to be "natural" might in reality be an error, contradiction or paradox of which we are unaware or only tacitly aware. To become aware of such flaws might seem "unnatural," hence such awareness is ordinarily avoided at all costs.

3.17 *Scientific, literary, philosophical, mythical, religious, etc. texts: different forms of awareness.* Precisely what are these different forms? The supposed dichotomy between scientific and literary texts provides an adequate focus.

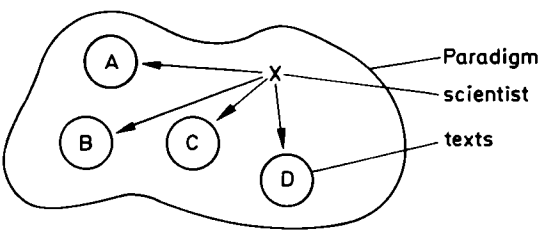


Figure 13

Person (x) from within a particular scientific paradigm reads scientific texts (A-B-C-D). If they correspond adequately to the paradigm he has internalized – and on approaching the texts he expects them to do so, hence he tries to make them fit – he considers that they contain by and large "true" statements about the world. If not, they are usually wholly or in part "false." Sentences in the scientific text are not in general looked upon as fictions or nonsensical. Only when reading a nonscientific text from within this scientific perspective can the text be properly fictitious, meaningless, or nonsensical.

In contrast, the reading of a literary text ordinarily follows this diagram:

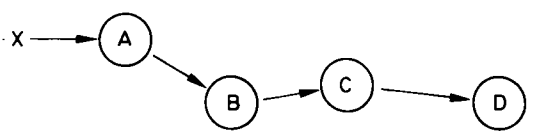


Figure 14

(x) exists in an undefined set of scientific, religious, literary, and other partly ideologically-grounded subcultural CFs. He willingly suspends disbelief on approaching each literary text and hence accepts the basic premises of each "as if" it constituted a world, a fictive world. If the text coherently stands on its premises and is well-written it is an aesthetically adequate text. One might tend to say that it is "true" within the frame of its internal system although it may be partly nonsensical with respect to the cosmology or cosmologies from which the reader approached the text.

However, there is still a problem here. In the process of reading a scentific text written from within the same CF as the one internalized by the reader, it is necessarily assumed at the outset that what is therein stated is by and large "true" with respect to the world. This is not the case of the literary text which presumably need not correspond to the physical world. The reader's cosmology "outside" the artistic text he reads is ordinarily his "true" picture of the world. What he reads as an aesthetic fiction gives him pleasure, but when it is placed beside his internalized CF which presumably contains "true" statements about the world this literary text may be looked upon as sheer nonsense.

But the artistic text is not meaningless, as nonsensical statements are usually conceived to be, for it tells the reader about life, about the human condition, about aspirations, desires, solitude, pain, joy, etc. The text is not just a nonsensical fiction because it contains what can be conceived as potentially a set of valid statements about the reader in his "real" world. Hence the literary text is separate from the reader's CF and his general cosmology, but it tells him about himself and becomes part of his life, hence it becomes part of his CF and his cosmology. Therefore it is simultaneously disjoined from and conjoined with his CF and his cosmology: a paradox. Yet this situation is imperative in order that the text be made intelligible.

3.18 *Texts are intelligible only with respect to an alternate perspective or to some other text.* This applies even to the literary text, for if the literary text were totally and categorically disjoined from the reader's CF and cosmology it could not be made intelligible. *Alice Through the Looking Glass* is a good example of a literary text which is radically illogical with respect to our ordinary conception of the world; it is apparently disjoined from the "real" world. Yet when we read the book we enter into it and perceive those illogical events "as if" they might possibly be "true": they belong to a possible fictive world. But is not that text capable of being illogical only in so far as it is perceived *with respect to* something or some other world which is conceived to be logical? Could it be a possible fictive world if we were incapable of relating it to our world, The World?

An example. The White Queen says to Alice: "'Can you do Division?

Divide a loaf by a knife – what's the answer to *that*?." (Carroll, 1960, 220). We might with reason say that it is illogical or nonsensical. But we generally do not tend to say that it is meaningless. Why? It can be illogical or nonsensical only in so far as it does not conform to our established conventions of mathematics. Would that statement be illogical or nonsensical if we possessed *no* mathematics, *no* concept of division? Yet that statement *is* or *can be* meaningful, even though nonsensical or illogical. But it can be so only *with respect to* and *in relation to* our world as we ordinarily conceive and perceive it. Hence what is intelligible is so only *with respect to* prior expectations and to the conventional standards of intelligibility.

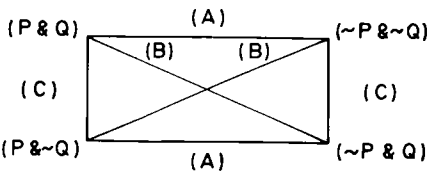
Todorov (1968) tells us that the concept of *vraisemblance* in the literary text involves the text's relation to other texts in terms of the dictates of literary tradition and of public opinion, but more importantly perhaps, the reader must believe that the text somehow conforms to some aspect of the external world. However, perception of the literary text is not so simple. This mysterious conformity of the work to the external world either in a positive or negative sense demands prior existence of that world with which confirmity is potentially made possible. But the literary text must exist apart from the external world as well as apart from the reader's standards of truth, logic and nonsense handed down to him by the CF which by and large determines what his world is. Yet at the same time, if the text is not somehow integratable into that world and that CF by means of the paradoxical nature of the perception of the fiction, it will be necessarily unintelligible. The paradox is perpetually unresolvable, yet it is tacitly resolved because it is perpetually open/opened.

Let us now take Coleridge's axiom to its logical extreme.

3.2 Toward a General Model of Text Perception

3.20 If, according to 3.1, awareness of category mistakes, contradictions, and paradoxes potentially results from a breach of boundaries, and if such a breach of boundaries is potentially perceived in texts by means of unique SS-system constructs, then there must be some set of perceptual modes through which one can perceive this textual novelty at conscious and/or nonconscious levels. And this set of perceptual modes must be interrelated such that a transformation from one given mode to another can enable one to construct/perceive novelty by means of an intra-SS-system or an inter-SS-system "switch." In light of this assumption, the task at hand is now to define the set of all possible perceptual modes by means of which texts can be read.

3.21 *Multidimensional readings.* With regards to the reading of literary and nonliterary texts through conscious or nonconscious and willing or unwilling suspension of disbelief, consider Figure 15:



Where:

~ = "non"
(P & Q) = a conscious willingness to suspend disbelief.
(~P &~Q) = a nonconscious unwillingness to suspend disbelief.
(~P & Q) = a nonconscious willingness to suspend disbelief.
(P &~Q) = a conscious unwillingness to suspend disbelief.

(A) = contradictory relations.
(B) = contrary relations.
(C) = complementary relations.

Figure 15

(P & Q) is the perceptual mode for properly reading literary texts "as if" they were "real," with all the inherent paradoxical implications as described in 3.15.

From within the (P & ~Q) mode the reader either: (a) simply and categorically labels the text as false, or perhaps illogical, meaningless, or nonsensical, or (b) sets up doubts concerning the text's premises, and hence potential doubts concerning the validity of the SS-system and the CF partly portrayed in that text. (a) represents a *dogmatic* mode. From within this perspective the reader can be rarely prepared for conceiving/perceiving novelty, for a *Gestalt* "switch." With respect to (b), the reader has set up a mode of *doubt,* or intentional disbelief, by means of which potentially to criticize the premises underlying the text (and the CF it partly portrays) *with respect to* his own internalized CF. During this period of critical evaluation the reader himself might possibly encounter something new with a certain truth-value of which he was not previously aware. When such occurs he must also have intermittently placed himself in (P & Q) in order to perceive that new item of experience "as if" it were part of his "real" world. Only in this way can his doubting mode go to completion, since from within (P & ~Q) what he reads, even though it is doubted, must be

juxtaposed with his "real" world in order critically to compare and contrast the two. If not he may reject it, and he can re-enter the *dogmatic* aspect of the (P & ~Q) mode. In this case, the novel construct is categorically perceived as "false"; that is, if he has abandoned his *doubt.* In general, the (P & ~Q) mode implies either a potentially open or a closed system of *thought* where the reader consciously and conscientiously doubts, or simply does not believe what he reads since it appears to correspond little or not at all to his internalized CF.

Perception from within the (~P & Q) mode is the product of a *belief system* which entails embedded culture-world knowledge of actual and possible SS-system categories and meanings. The reader from within this mode reads a text "as if" it corresponds to his CF without awareness of the "as if"; therefore he simply receives it as "true." He believes that it corresponds adequately to his internalized CF, and his belief system, the result of continuously having followed conceptual and linguistic pathways of least resistance, enables him further to embed his culture-world knowledge with each such reading. The habitual reader of his religious canons, or the experienced scientist reading texts written from within his scientific paradigm, are examples of such reinforcement and progressive embedment. These readers, like the dogmatic reader, are generally not well prepared for surprise, for the shock of experiencing a novel construct when reading texts they tacitly assume it to correspond to their own CF.

On the other hand, (~P & ~Q) is either: (a) the product of *habit* at even deeper levels of embedment, or (b) representative of the reader's *total ignorance* of any and all alternatives. The text in this case is read, so to speak, with child-like innocence. The world automatically *is* what the text *says,* or it is totally unintelligible. In other words, the reader in a blind way is incapable consciously of suspending disbelief in any perspective other than his own, for he cannot be aware of any other. His reading is, to evoke Wittgenstein's ambiguous "rabbit-duck" drawing, a view limited either to one or the other. There is no possible awareness of the alternative. As far as the perceiver is concerned, the whole world is either "rabbitness" or "duckness." If it is "rabbitness," then "duckness" simply does not exist. And if we try to convince him that "ducks" can exist our words fall on deaf ears. That is, beyond "rabbitness" he is, in the Wittgensteinian sense, "consigned to silence." (~P & ~Q), consequently, represents an idealized form of total incommensurability between frameworks according to the above-discussed *Weltanschauung* hypothesis.

Now for a few examples. Consider the following statements:

(8) Flying planes can be dangerous.

(9) There are four continents and four races on this earth.

(10) Matter consists of absolutely rigid, indivisible, and compact units called atoms.
(11) Atoms are divisible.
(12) "Square circles" are real.
(13) "I am lying."

Imagine the South Sea Islander who does not know that humans fly airplanes. To her a statement the equivalent of (8) is not at all ambiguous. From within her CF it seems that she perceives it from within the (~P & Q) mode. Of course, that is because she is completely unaware of any alternative meaning. She not only does not suspend disbelief in the possibility that humans fly airplanes, she is totally unaware of that possibility as a potentially viable alternative to a particular aspect of her world-view. From within a broader framework, then, we can see that her perceptual mode with respect to the second meaning of (8) is actually (~P & ~Q). And it cannot become anything else until we inform her of that second meaning. Then she can either doubt us, from within (P & ~Q) – (P & Q), or she can simply and dogmatically disbelieve, from within (P & ~Q).

Now, repeat (9) to an early fourteenth century European scholar who believes and even "knows" that there are only three continents and three races on the earth. Assuming that you are not immediately burned at the nearest stake, you will not effectively communicate with him until you explain your statement in such a way that he can at least become aware of the reason for his unwillingness to suspend disbelief in it. That is, whereas in the (~P & ~Q) mode your statemement was to him meaningless, nonsensical, or totally unintelligible, after being made aware of your perspective his perceptual mode could possibly become (P & ~Q). Now the statement would most likely continue to be for him "false," but it certainly would no longer be merely unintelligible.

Say (10) to the Newtonian physicist deeply embedded in his scientific world-view. It is for him automatically "true" for he listens to your statement from within (~P & Q). His scientific CF, in fact his total world-view and culture-world knowledge, is sufficiently embedded such that he is no longer explicitly aware of the presuppositions underlying what he believes to be "true." The world *is* what it *is*. Now say (11) to him, and he might perceive it dogmatically from (P & ~Q); in such case it is therefore for him automatically "false." He is not only aware of this "falsity," but he knows that it does not correspond to his beliefs. In fact, he can most probably articulate many of the contradictions between (11) and his beliefs. Yet those beliefs themselves are embedded such that he responds in a rather automatic way to "outside" statements, unable effectively and completely to articulate his reasons for such response at the deeper levels.

If you go find a doubting Newtonian physicist and repeat (10) to her, she might perceive it from within (P & ~Q), but this time it is not categorically declared "false" or "true." It is subjected to critical inquiry, to comparison and contrast with apparently contradictory statements from within her CF and perhaps other possible CFs. During this process it must also be intermittently looked upon "as if" it were possibly "true" from within (P & Q).

The two levels of (P & ~Q), then, become more evident. The dogmatist's world is either-or. The doubter's world is possibly one or the other, or possibly both one and the other. The first world is that of crystal-clear and distinct concepts, the second that of vagueness, ambiguity, contradiction, and paradox. The first entails relative simplicity, the second a higher level of complexity. Every human being's world, of course, is always a combination of both tendencies (cf. 0.13).

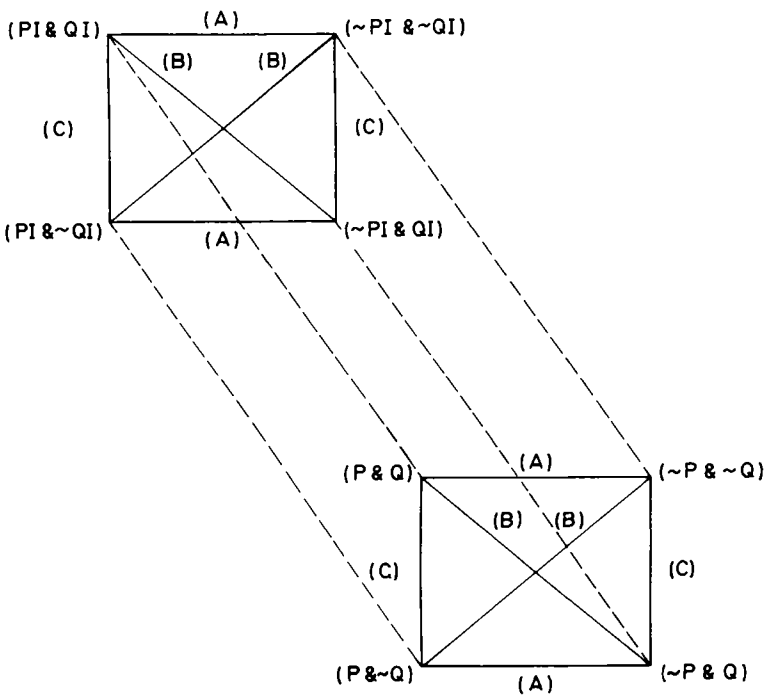
To continue, (12) can be perceived through (P & Q) as a fiction from an impossible world. Questions concerning its validity need not necessarily be asked, for it is simply accepted at face value. But, of course, this impossible world need not correspond to what is ordinarily conceived and perceived to be the "real" world. Yet the oscillation described above between the "inside" fictional world and the "outside" world as it is conceived and perceived by the reader is necessary in order that it can (paradoxically) become part of the reader's form of life in his or her "real" world.

Now consider (13). From within (P & Q) one can conceivably, and at will, oscillate between the two contradictory alternatives present in this statement. On the other hand, from within the (P & ~Q) mode one possesses awareness of the contradiction, yet it will be perceived categorically as meaningless or nonsensical, or there may be an attempt critically to resolve the paradox. When (13) is perceived from (~P & Q), in contrast, one is not conscious of the two alternatives. Yet it is there, and it can effect one's response, placing oneself in a "double-bind" situation (Bateson, 1972). This is like the "Be spontaneous" command. One is placed in a dilemma by the paradoxical injunction without, from the (~P & Q) mode, knowing explicitly the nature of the paradox. However, (13) from within (~P & ~Q) is no problem. Not only is there no awareness of the contradictory alternatives, there is no "bind." One of the two alternatives is simply not part of one's world. For instance, tell (13) to a being from a world in which lying does not exist, and even though you try your best to explain its meaning, to him it will remain unintelligible or perhaps merely nonsensical as long as he perceives it from within the (~P & ~Q) mode.

3.22 *The egocentric modes.* What I have described thus far pertains to texts read as if they potentially or actually existed apart from the reader's

self and from his or her CF. This can never be the case in real-world situations. There is no such thing as the totally uncommitted Cartesian doubter or the detached observer completely free of preconceptions. There necessarily exists another level of perceptual modes distinct from the level illustrated in Figure 15. This level contains the individual *self* (compare this level to Hofstadter's, 1979, "self-subsystem"). It is essential since, as postulated in Part 2 and as put forth in DEFINITIONS 2-II to 2-IV, one's *self* can never be separated from one's body of culture-world knowledge.

With this in mind, let each letter in Figure 15 be followed by an "I," representing the CF of which the *self* is unavoidably a part. We now can construct an additional set of relations as follows:



(Where the broken line denotes the indissoluble link between the idealizations of total detachment and total commitment.)

Figure 16

(PI & QI) represents the stream of uninterrupted *sensations* which are ideally passively received, a sort of "blooming, buzzing confusion," as James calls it. For practical purposes, however, this is an unfeasible notion since all organisms, even down to the most simple, select (abstract) from their environment that which is meaningful and necessary for survival (Hayek, 1969). (PI & QI) can in addition, from the human perspective, represent a totally unmediated experience "of the sort [that] does from time to time occur in psychotherapy, religious conversion, and in other sequences in which there is a profound reorganization of character" (Bateson, 1972, 301). This is what Bateson calls "deutero-learning" or "learning III" (see also Merrell, 1982). Hence (PI & QI) is in the context of this inquiry the mode by means of which a holistic CF "switch" can occur.

(~PI & ~QI) is the product either of *instinct* or *embedded habit.* The first case represents an organism's automatic selection from the myriad array of sensations it receives. The second, in contrast, involves a distinctly human level of awareness which can be explained in terms of the *automated signals, linguistic signs,* and *SS-system entities* generated from within one's own CF (reconsider Figure 3 in 1.23). This mode is necessary to the scheme in Figure 16, although innate or embedded activity is not the direct focus of interest here. We must, on the contrary, be concerned with the conscious and nonconscious suspension of disbelief in text construction/perception.

The other two "egocentric" modes in Figure 16 are, on the other hand, crucial for the purpose of the present inquiry. (PI & ~QI) and (~PI & QI) require a human level of conscious self-awareness which includes the capacity for constructing/perceiving self-referential statements at increasingly higher meta-levels. (PI & ~QI), a conscious unwillingness to suspend disbelief in one's own beliefs, can represent the emergence of skepticism and doubt with respect to one's internalized CF or to a text written presumably from within that same CF. In other words, the reader of a text has in this instance taken a *self-critical* view of his or her own presuppositions. A text, presumably based on these or similar presuppositions, is not simply accepted as a possible world in the sense of (P & Q), nor is it conceived to be capable of standing on its own premises as a literary text. Neither is the text merely perceived in a dogmatic sense to be "false." It is perceived intermittently "as if" it were "not real" from within (PI & ~QI) and "as if" it were "real" from within (P & Q) in order potentially to disclose underlying meaning and possibly to lay bare an underlying ideology, or axioms, premises, myths, irony, ambiguity, satire, rhetoric, etc. by means of which the underlying textual contradiction or paradox can become evident. This self-critical act, of course, is derived from doubt. But in order to acquire a doubting (disbelieving) spirit, there must have been previously a belief in something

else against which that doubt could arise. Only then could that which was once believed be placed alongside its apparent opposition in order to verify or falsify the reason for such a doubted belief.

The opposition I speak of is precisely the meaning of the text viewed from the (~PI & QI) mode as opposed to its meaning when viewed from (PI & ~QI). This mode entails a reading of a text from what would ordinarily be a believing mode (that is, a nonconscious willingness to suspend disbelief in the text) but which has become the doubting mode. When belief becomes doubt, the following TRANSFORMATION must occur:

$$(\sim PI \ \& \ QI) \xrightarrow{(A)} (PI \ \& \sim QI)$$

(That is, through [A] one perceptual mode has been transformed into its contradictory mode.)

What was automatically and dogmatically construed to be "real" is now perceived "as if" it were "not real" or only possibly "real." And, if we reverse the arrow, doubt, when confirmed or falsified, can revert back to the same belief or become another belief. Hence:

$$(PI \ \& \sim QI) \xrightarrow{(A)} (\sim PI \ \& \ QI)$$

What was read "as if" it were not really "real" is now construed to be "real" from a distinct perceptual mode.

3.23 *Operational rules.* A description of all possible transformations between the class of perceptual modes proposed is certainly more complex than I have indicated thus far. The complete task remains necessarily beyond the scope of this study. I can and do intend, however, to propose: (a) a set of rules which govern the possible transformations between certain, more relevant, perceptual modes in Figure 16, and (b) a fundamental set of transformations which have a bearing on the present inquiry.

Reconsider, for a moment, the relations between the *perceptual modes* in Figure 16. Like those in Figure 15, they are *contradictory* (A), *contrary* (B), and *complementary* (C). (P & Q) *contradicts* (~P & ~Q) since one is the total negation of the other. (P & Q) is *contrary* to (~P & Q) in the sense that, although willingness to suspend disbelief is the same, consciousness is either present or absent. And (P & Q) *complements* (P & ~Q) since, although both are conscious states, they are mutually exclusive in so far as one entails an involuntary act and the other a voluntary act. Complementary relations ultimately have a bearing on what is construed to be the ontological status of that which is being perceived. From within (P & Q) an "as if real"

construct is generated which would ordinarily be perceived "as not (yet) real" from within (P & ~Q). And from within (P & ~Q) items of experience are construed "as not (yet) real" whereas from within (P & Q) they would ordinarily be "as if real."

Now, let us call the perceptual modes and the relations between them in Figure 16 a *group*. The perceptual modes in this group can be *transformed* by means of *operations* which take them to *contradictory*, *contrary*, or *complementary* modes. Such transformations occur according to the following set of rules (see also Barbut, 1970; Blanché, 1966; Piaget, 1949, 1953):

(a) Any two transformations have as their resultant the third transformation. Hence: (A) (B) = (C), (A) (C) = (B), and (C) (B) = (A).
(b) There is an "identity" operator, (I), which, when applied to any transformation, does not change it. Hence: (A) (I) = (A).
(c) Each transformation is *involutive*. Repeating it twice gives the "identity" operator, and the system is structurally the same as it was. Hence: (A) (A) = (I).
(d) The combination of all transformations gives the "identity" operator. Hence: (A) (B) (C) = (I).
(e) No matter how a set of transformations is combined, the result is always the same. Hence: [(A) (B)] + (C) = (A) + [(B) (C)]. (This is called *associativity*.)
(f) One transformation followed by the second gives the same result as if the second transformation preceded the first. Hence: (A) (B) = (B) (A). (This is called *commutativity*.)

Some clarification is necessary with respect to the dual-level nature of Figure 16. Let us consider that the "identity" operator, (I), is responsible for taking a transformation from the "outside" to the "inside" rectangle. Now imagine, for example, the act of reading a fiction. The text is first placed in (P & Q), but to be properly intelligible it must be read with respect to the reader's internalized CF and his conception and perception of his world. This is the reader's (~PI & QI) mode; that is, if he is not reading the fiction from the critical mode. The transformation from (P & Q) to (~PI & QI) is from one mode to its contrary mode by way of the complementary (P & ~Q) mode, since the reader obviously knows the fiction is not "real." Hence: (P & Q) $\xrightarrow{(C)}$ (P & ~Q) $\xrightarrow{(A)}$ (~P & Q) $\xrightarrow{(I)}$ (~PI & QI); or in composite, (P & Q) $\xrightarrow{[(B)\,(I)]}$ (~PI & QI). Consequently, the item of experience is taken to the reader's world and becomes part of it. However, as posited in 3.15, there is an ongoing oscillation between the two contradictory perspectives. Hence the reverse transformations are in effect: (~PI & QI) $\xrightarrow{(I)}$ (~P & Q) $\xrightarrow{(A)}$ (P & ~Q) $\xrightarrow{(C)}$ (P & Q); or in

composite, (~PI & QI) $\xrightarrow{[(B)\ (I)]}$ (P & Q). Now, since (A), (B), and (C) have been taken twice during the transformations and their inverses, the sum of these transformations is presumably as if there had been no structural change. That is: (A) (A) = (I), (B) (B) = (I), and (C) (C) = (I); or in composite, [(A) (B) (C) = (I) + (A) (B) (C) = (I)]. The reader's item of experience has been "interalized" and then "externalized" again, but of course he is not actually in the same state following this activity since a "memory trace," so to speak, now exists for him. (I), the "identity" operator, is the means by which the Ego separates itself from the Other while at the same time remaining inexorably part of that Other. And this interaction between Self and World, Ego and Other, "inner" and "outer," is precisely what can prevent permanent closure of all systems. Consequently, the two *groups* in Figure 16 do not actually possess group closure properties in the strict mathematical sense. They are perpetually opened at meta-levels by the mediating mind (as put forth in PROPOSITION IV) (see also Merrell, 1982, for further discussion of this phenomenon).

3.24 *Dynamic transformations of perceptual modes: "switches."* The transformations from (PI & ~QI) to (~PI & QI) can certainly be evolutionary as is the case of embedment, a gradual phasing out of consciousness when one, through habit, constructs/perceives *semions* and *symbols* automatically (cf. Figure 3). However, it can also be dynamic when a "leap of faith" occurs and one acquires a new belief system. And the "switch" one realizes when that old belief system is instantaneously destroyed and replaced by another belief system is certainly revolutionary. In order adequately to describe these phenomena let us focus on (P & ~Q) and (PI & ~QI) since these two critical modes represent the most logical preparation for reception of a surprise: the realization of novel SS-system entity usage.

The self-critical (PI & ~QI) mode affords a possible reading of the "para-realistic" level of the text. That is, this reading potentially discloses meaning which is otherwise implicit and at the underlying level. Such a reading constitutes an act analogous to Barthes' (1972) demystification of modern myth, or Turbayne's (1962) or Vaihinger's (1924) destruction of scientific dogmas: a sudden "click" of comprehension. (~PI & QI), on the other hand, entails the embedment into consciousness of conventional language use, presuppositions, acquired dispositions, myths, and in general, all forms of cultural conventions. Texts from within this mode and from within a particular CF are approached and read by previously and involuntarily suspending disbelief. Consequently, from this mode the world *is* as the reader believes it to be. And if the text confirms that belief it is not questioned. In this case, there is no critical doubt or skepticism, nor is there dogmatic disbelief. Moreover, the difference between the ideal detached (~P & Q)

mode and the egocentric (~PI & QI) mode is that from the first a text is nonconsciously "as if" it corresponds to the reader's CF, while from the second the reader nonconsciously maps her embedded CF into/onto the text. Actually, of course, either act, that of bringing the text to the CF or taking the CF to the text, cannot exist in isolation. There must always be a combination of both.

On the other hand, the critical reader must by virtue of her perceptual mode be capable of some form of partial detachment. It is certainly the case that within (P & ~Q) the self is not as close to the text as in the (~PI & QI) mode. Whereas the critical reader relatively objectively reads a text outside her CF in the (P & ~Q) mode with the intent of criticizing or developing counter-arguments, the self-critical reader engages in self-reflexive discourse in an effort to discover flaws in her own CF and in texts presumably written from within the same or analogous CFs. Whichever the case the "switch" from a critical mode to a mode of belief is equally instantaneous. In this sense, just as when reading a fiction there is oscillation between (P & Q) and (~PI & QI), so in critical evaluation oscillation must exist between either (PI & ~QI) or (P & ~Q) and (P & Q). Hence, in order for a *Gestalt* "switch" to occur some interaction is essential between the critical mode(s) and the "detached fictional" mode. That is to say, the instantaneous "flash of insight" is atemporal, aspatial, and hence it cannot be centered exclusively in the time-bound self. It must somehow, and apparently simultaneously, be "outside." What we must now be able to describe is the transformation from the critical or self-critical reader to the "true believer" through a "leap of faith," a *Gestalt* "switch."

Therefore, assume the following:

(a) (P & Q) is the key to *Gestalt* "switches." This mode represents the potential for suspension of disbelief in each and every alternative. Call it insight, intuition, or abduction, perception from within this mode is, like Bateson's "deutero-learning," a metalevel from which alternating perspectives can be perceived in some idealized detached way by means of oscillation from one to the other (cf. 3.15).

(b) Concomitant with the instantaneous "flash of insight," the existence of (~PI & QI) is necessary, since from that perceptual mode the insight must instantaneously be accepted by a major or minor "leap of faith" and, at least for that moment, conceived as a new form of "truth."

(c) (~P & Q) is also necessary since whatever is perceived through (P & Q) must be instantaneously accepted as an "outside" construct corresponding to the "real" world before it is internalized as (~PI & QI).

(d) Since a "flash of insight" entails necessarily a major or minor *Gestalt* "switch," there must be a "leap" from one perceptual mode to another

apparently *contradictory* (or incommensurable) mode which lies horizontally or diagonally to it according to Figure 16.

(e) If the "flash" transforms an individual from one perceptual mode to another *contradictory* mode, that transformation cannot occur directly but must be mediated by perceptual modes whose relations are *complementary* (i.e., the vertical relations in Figure 16).

(f) *Complementary* relations are necessary for such transformations due to the possibility, by means of them, for oscillation between two *contradictory* modes.

3.25 *Preliminary transformations.*

Let the following transformation be called the "internal perception of a novel construct."

$$(\sim PI \ \& \ \sim QI) \xrightarrow{[(A)\,(I)]} (P \ \& \ Q)$$

As illustrated by (N) and (O) in Figure 4 (cf. 2.21), new ideas can potentially be perceived and then finally articulated by means of the mind's receiving something of which it was previously unaware and which would have ordinarily been looked upon as "false," meaningless, nonsensical, or merely unintelligible. Disbelief, as a result of this transformation, is suspended, and new items of experience can potentially be integrated into the internalized CF. This type of novelty can be derived from: (a) instinctual (innate) dispositions (capacities), (b) the emergence into consciousness of deeply embedded culture-world knowledge, or (c) a novel synthesis of the ideas, intuitions, and data one has, usually intensionally, assimilated just prior to the experience (recall such dramatic experiences as Kekule's dream-world experience leading him to discover the structure of the benzene molecule, Poincare's mathematical creativity, Einstein's thought experiments, etc.; see Hadamard, 1945). Perception of novelty in this sense can also serve to transform one's entire CF: a CF "switch."

Second, consider the "perception of novelty by the total experience."

$$(PI \ \& \ QI) \xrightarrow{(I)} (P \ \& \ Q)$$

This transformation entails the perceptual mode when all items of experience are for some almost-instantaneous duration of time uninterpreted and unabstracted (unselected), and consequently a radically new perception can be forthcoming. Such perception is comparable to, as mentioned above, mystical experiences, experiences during transcendental meditation, drug-induced experiences, etc.

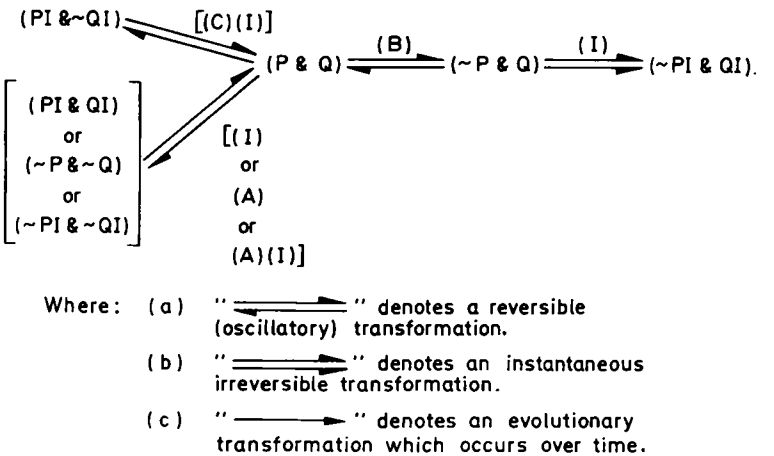
A third transformation is the "external perception of novelty."

$$(\sim P \,\&\, \sim Q) \xrightarrow{(A)} (P \,\&\, Q)$$

Radical ideas requiring a holistic *Gestalt* "switch" from one conception/perception of the world to another can also be received from outside one's internalized CF. Such is the case of the well-formed argument which effectively "converts" the perceiver to a new world-view (see examples in Feyerabend, 1975; also, I have talked to quite a few linguists who, after reading Chomsky's *Syntactic Structures*, were irreversibly swayed by his compelling argument).

3.26 *Compound transformations.*

Now let us consider some more complex transformations. First: (I) TRANSFORMATION PRECEDED BY SELF-CRITICISM.

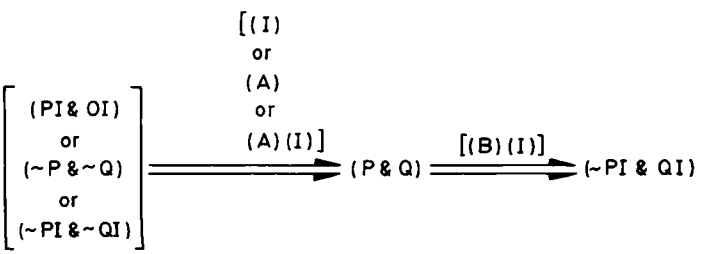


(PI & ~QI) is the critical mode which is transformed into the meta-perspectival mode through [(C) (I)]. [(PI & QI) or (~P & ~Q) or (~PI & ~QI)] are the possible sources of the novel items of experience which lead to the "flash of insight." Respectively, they represent "unmediated sensations," "novelty from without," or "novelty from within by de-embedment or intuition" (i.e., the first simple transformation above). The transformations occur through [(I) or (A) or (A) (I)] to (P & Q). (P & Q) is then transformed into (~P & Q) through (B). (~P & Q) represents a non-conscious "leap of faith" at which time the perceiver at least momentarily perceives his novel items as "true." If the creative act goes to completion, at least temporarily, a transformation occurs from (~P & Q) to (~PI & QI) through (I). Now,

from the (~PI & QI) mode, novel items of experience can be incorporated into the perceiver's belief system (CF). Moreover, depending on the source of these novel items of experience, the "switch" can be either "evolutionary" or "revolutionary."

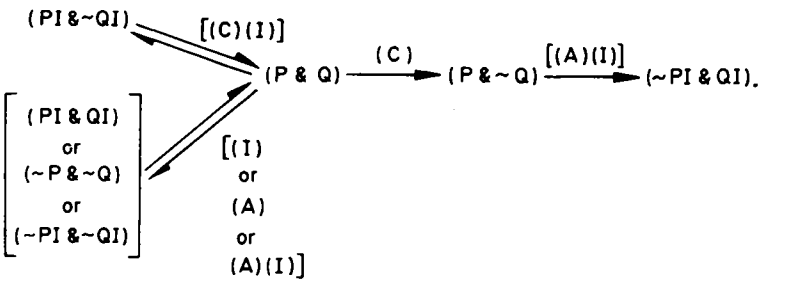
It bears mentioning in addition, that such a "switch" can also occur when the perceiver is criticizing and counterarguing a perspective presumably incommensurable with his own belief system (CF). In such case the transformation through [(C) (I)] is replaced by a transformation directly from (P & ~Q) to (P & Q) through (C).

The second transformation of import to the present inquiry is what will be called: (II) TRANSFORMATION BY DEFAULT.



Here the system is, so to speak, "short-circuited." This is the situation of, say, the schizophrenic who constructs his own world by "negating" his previously perceived and conceived world (in the sense of Sartre, 1962). This previous world never directly interacts with the new world which is not "seen" through (~PI & QI) and of which the self has become instantaneously and, at least for the moment, irreversibly a part. Since there is no necessary relationship between the subject's previous world and his new world, they are, we must presume, totally incommensurable. The subject now views that old world through the (~P & ~Q) mode; that is, it is for him virtually nonexistent. In this sense the "as if" construct cannot be consciously juxtaposed with the world which was previously construed to be "real." Significantly, if the transformations are changed from irreversible to reversible, we have the case of the movie-goer or the perceiver of a play, etc. who momentarily loses consciousness that she is supposed to be perceiving a fiction and construes it to be "real" (see Merrell, 1983, for a detailed discussion of this phenomenon).

The third transformation, existing at a more consciously controlled level, is: (III) TRANSFORMATION BY POSTULATION (FROM SELF-CRITICISM).



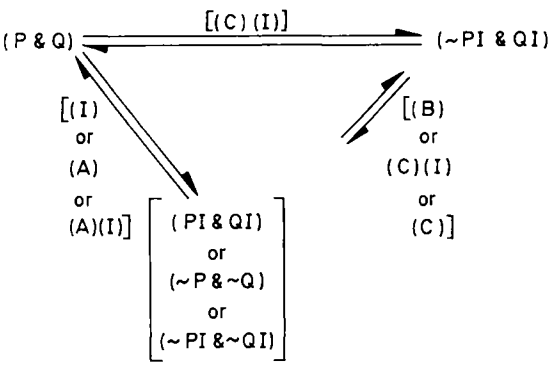
This process might be classified as "evolutionary" scientific, or any other, conceptual change. By means of the "switch" through [(C) (I)] and [(I) or (A) or (A) (I)] novel items of experience are received, but they do not yet correspond adequately to the subject's CF. Hence they must be consciously and intentionally postulated by means of an "as if" hypostat in the (P & Q) mode (in the sense of Popper's, 1963, conjectures). This "as if" hypostat is consciously transformed to the (P & ~Q) mode through (C) from which perspective it is viewed as a potential model or metaphor by means of which to make some aspect of the world more intelligible (cf. Black, 1962; Hesse, 1966). It can then be tested for possible falsification if it is a scientific model to be validated, or it can be judged for its aesthetic or operational adequacy, if a metaphor or analogy in art or in various aspects of practical everyday living. If the model or metaphor proves to be successful it can consequently be integrated into what is now the subject's altered CF. By this process of "evolutionary" embedment, then, it becomes part of the (~PI & QI) mode through (A) (I). It can now be perceived as "real" or at least metaphorically valid.[2]

Notice the similarity between TRANSFORMATION (III) and TRANSFORMATION (II). Whereas the schizophrenic's "postulation" of a new perceptual world by "negation" of his old world is an instantaneous act, the conscious act of transformation-by-intentional-postulation can only be fully realized through time. Yet each transformation is equally unmediated. The creative insight in both cases is put directly into contact with the world. Of course, the very important difference is that the schizophrenic immediately and irreversibly imposes his new, incommensurable, world on his old world, while according to TRANSFORMATION (III) the subject in the beginning is capable of retaining intermittent awareness of both perspectives while testing his newly found model, metaphor, or analogy. However, TRANSFORMATION (III) is appropriately "evolutionary." Eventually, as a consequence of embedment, during generations of language use in a particular community, part of that old perspective can be lost to

immediate consciousness such that, like the schizophrenic, the new perspective becomes dogmatically construed as the one and only "real" world. Such was the case of the "machine model" of the universe, which, over the accumulation of time, became "as if" it were a collective instantaneous act of schizophrenia!

The fourth transformation is: (IV) REVERSIBLE (OSCILLATORY) TRANSFORMATION (the non-critical reading of "fictions")

This transformation is precisely the non-critical (i.e., subjective) reading of a fiction as posited in 3.15 – for the non-critical mode (~PI & QI) replaces the critical modes (PI & ~QI) or (P & ~Q). Here, the reader, from within



(P & O), perceives a novel item of expereince in the text from [(~P & ~Q) or (PI & QI) or (~PI & ~QI) through [(A) or (I) or (A) (I)]. This novelty, however, would be by and large unintelligible without oscillation in and out of (~PI & QI) through [(C) (I)]. In this way the reader can read the text as it compares or contrasts with her world as she ordinarily conceives and perceives it. There must also be a direct and symmetrical path from [(~P & ~Q) or (PI & QI) or (~PI & ~QI)] to (~PI & QI). However, this path is not so predominant since the reader's reception of novelty in the text must be mediated chiefly through (P & Q), the "as if" mode: hence the smaller reversible arrow. The entire process is oscillatory, between "real" world knowledge and items of experience gathered from the fictive world. And, there must be constant feedback in both directions, for if not the transformation by default would ensue.

With respect to TRANSFORMATION (IV), the writer, on the other hand, creates novelty in the text by means of constructing, from within (P & Q), that which he receives from [(~P & ~Q) or (PI & QI) or (~PI & ~QI)]. Both the text construct and the source of novelty, however, must

interact with his own conception and perception of the world through (~PI & QI) or (PI & ~QI).

In addition to the above transformations, through habit or convention, or by continually following the pathways of least epistemological resistance, evolutionary embedment into consciousness can occur from (PI & ~QI) to (~PI & QI) and perhaps finally even to (~PI & ~QI). The reverse process would be gradual and intermittent de-embedment (see footnote 7, Part 1). Numerous other transformations can also be mapped out with respect to the model illustrated in Figure 16. However, I believe that the necessary foundation has been established for further development of the present inquiry. Let us now relate the last two subsections more specifically to the perception of CFs and SS-systems at a broad cosmological level.

3.3 Dreams, Art, and Conceptual Frameworks

3.30 The problem now is: Literary texts entail imaginary constructs of possible or impossible worlds, while scientific texts entail constructs believed capable of accounting empirically for The World, yet how is it possible to explain the existence of today's scientific "real" world models which in times past could only be conceived in terms of imaginary possible or impossible worlds? Or, how is it that what from within one scientific paradigm is a fiction, from within another paradigm is "real"? What is the *real* difference between juxtaposing two relatively incommensurable scientific paradigms (one supposedly true or "real" and the other false or "irreal") and two artistic and imaginary possible or impossible worlds (both of which are presumably "irreal")?

3.31 *Literary texts as well as scientific texts portray particular perspectives of the world or of a world: world models* (cf. PROPOSITION V). The literary text can easily and in a supposedly noncontradictory way contain various perspectives and distinct possible or impossible worlds. In contrast, the scientific text must ideally contain only one perspective, the "true" one. Moreover, the literary text, as has been reiterated often, is a world of and by itself. It presumably stands apart from all other textual worlds as a self-reflexive fiction. Nevertheless, the fact remains that the "root propositions" or "root metaphors" at the heart of all scientific SUB-LANGUAGES and CFs are fictions which have suffered relative degrees of embedment (see especially Pepper, 1942). Hence all scientific texts, like literary fictions, embody, to a greater or lesser degree and more or less explicitly, an imaginary construct (see in this respect, though his book is controversial, Eddington, 1958).

In order to illustrate the above point, consider the "scientific revolution" that can occur after a scientific text is constructed/perceived from a radically new and incommensurable perspective (Figure 17).

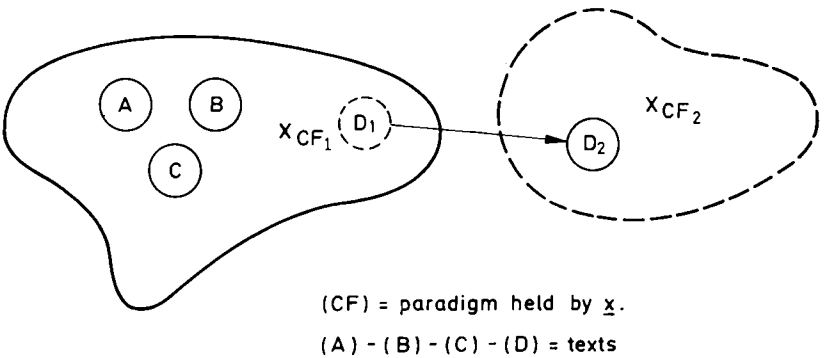


Figure 17

Scientist (x), from within his scientific (CF), begins construction of a text, (D_1), in an effort to resolve one of the numerous anomalies which have therein accumulated (i.e., in texts [A], [B], [C], etc.). At a given, but unpredictable, moment he realizes a *Gestalt* "switch" which places him in a radically distinct (CF); he now, so to speak, "sees" the world through different eyes. The (at this moment incomplete) transformations are: ($CF_1 \rightarrow CF_2$) and ($D_1 \rightarrow D_2$). But in order for these transformations to occur it was necessary for the scientist, on being converted to a distinct perspective, to unsuspend his "involuntarily suspended disbelief" in his old scientific world-view. During this process a transformation, perhaps TRANSFORMATION (I), occurred. As a consequence, what once constituted a "true" set of statements about the world is now viewed as "false," and what would previously be considered "false," a metaphorical fiction, or nonsense, might now be "true."

Sometime later, if by means of his arguments the scientist is successful in converting a sufficient number of his colleagues to this new perspective, a new paradigm-community might be established. The important thing to keep in mind is that he must convince them that their CF is "false" and his is "true." They must be converted to his view not only by compelling and logically cogent arguments, but, if necessary, by the use of *ad hoc* hypotheses, rhetorical trickery, propaganda, and appeals to emotions and prejudices of all kinds (see Feyerabend, 1975). That is to say, at some point in time he must cause them instantaneously and involuntarily to suspend disbelief in what for them was supposed to be a "false" world, and at this

point that "false" world is either continued to be perceived as "false" and no "switch" occurs, or it is instantaneously perceived as "true" and consequently their previous view of the world is altered. Hence, a radical CF "switch" in science entails an interaction between what is *within* the argument, textual or whatever, and what is brought to that argument from *without.*

In contrast, when reading the literary text or preceiving art in general, disbelief is voluntarily suspended while at the same time the perceiver maintains tacit awareness of the "real" world outside (cf. TRANSFORMATION [IV]). A CF or textual SS-system "switch" in this case is ordinarily perceived exclusively from *within.* Although such a "switch" can ultimately represent the creation-invention of a slightly-to-radically new way of perception from alternate perspectives, the reader may be intermittently aware of mutually contradictory interpretations of the literary text on oscillating from one to the other by means of the perceptual modes described above. This is much like viewing the *Gestalt* diagram now as two juxtaposed faces, now as a vase, or like perceiving Wittgenstein's drawing now as a duck, now as a rabbit. There appears to be no contradiction here since the fictional worlds are not really "real," they do not collide with what the reader ordinarily conceives to be the "real" world. Hence it appears that the mode of perception of scientific texts is the inverse of the mode of perception of literary texts. However, perhaps from another perspective the distinction becomes less precise. Let us see.

3.32 *Textual novelty: the analogical act.* It must be reiterated that a "revolutionary" CF "switch" is rare, and many times occurs as a result of experiencing the empirical world in a new way or as a result of non-textual argumentation. What must be considered here is SS-system change within texts which potentially alters the perspective of those texts, and which, on rare occasions, can "convert" the reader to a slightly or radically novel view of the world. With this in mind, and following from PROPOSITION I and COROLLARIES I and II, we can obtain:

COROLLARY III: The construction/perception of all SS-system entities is the product of the same cognitive mechanism.
COROLLARY IV: The construction/perception of all novelty in texts by means of SS-system entities entails an analogical act.

Compare scientific texts with mythical or religious texts. The believer of these latter texts "knows" that they provide "true" statements about certain material and nonmaterial aspects of the world; hence for him they correspond to "reality." Many of the SS-system entities in these types of

texts pertain to that which is ineffable, inexplainable, mysterious; hence such meaningful entities are properly *symbolic*. On the other hand, the SS-system entities in scentific texts are, we would suppose, primarily *semionic*. Nevertheless, a portion of the scientific text, that which refers to embedded aspects of the CF, is also inexorably *symbolic* and usually tacitly implied. This would indicate that the difference between mythical-religious texts and scientific texts is in function rather than kind, a notion recently advocated by a diverse number of scholars (for example, Auger, 1965; Cassirer, 1942; MacCormac, 1975; Phillips, 1972).

We would naturally expect that the literary text also manifest both *symbolic* and *semionic* characteristics. The chief different between literary texts and either mythico-religious or scientific texts is, to repeat, that literary texts need not refer directly to the world. Within the literary text, therefore, virtually anything is possible as long as it coheres with the text's initial premises. In this respect Frye (1957) suggests that the literary text, like logical and mathematical texts, is relatively *freely created* in a relatively *autonomous conceptual realm*. The question is: What exactly is meant by the vague idea, referred to often, that "anything is possible" in that "autonomous conceptual realm" wherein all creative acts occur? Let us begin at the beginning with the "analogical act" which lies at the heart of all creativity.

The analogical act I refer to has been properly called the "logic of discovery" (Hanson, 1958b, 1965; Toulmin, 1974; see also Peirce's abduction, 1960, 1.180-194; or, in a more general sense, see Koestler, 1964; Leatherdale, 1874). Analogical acts are presumed to be, as is rather obvious, instantaneous and irrational. The problem is that although grasped in a "flash," they can be appropriately articulated/perceived in texts solely over a prolonged period of time. Such painstaking and explicit (re)formulation of the instantaneous analogical act might be called, in contrast to the "logic of discovery," a "logic of inferential reasoning." However, in this subsection I will be concerned chiefly with the atemporal and aspatial "flash."

It is axiomatic that to dream of, say, unicorns is impossible if horses, horns, or animals with horse-parts have never been experienced (see Wittgenstein, 1958). However, it can safely be stated that the number of possible combinations of the total set of one's past and present items of experience in all possible and impossible worlds is, for practical purposes, unlimited. Most creations by means of analogical acts (i.e., a unicorn, a winged horse, the body of a horse with the torso and head of a man, etc.) are contradictory combinations of items of experience from the "real" world. They represent a breach of taxonomic categories, the foundations of a category mistake, or even a paradoxical situation. However, such anomalies

within dream realities are not considered to be absurd, contradictory, or paradoxical since dream images, as all imaginary constructs, are strictly intensional. In this sense there is no real conflict between dream and world. That is to say, dreams and hallucinations, like literary texts, and all imaginary constructs, can embody juxapositions of what in the "real" world would ordinarily be considered incommensurable, contradictory, absurd, nonsensical, or anomalous objects, acts, events and worlds.

The above hardly needs stating. Compare it, however, to this rather controversial statement about science: When viewed from above, a collection of scientific models from distinct paradigms represents the juxtaposition of relatively incommensurable, contradictory, absurd, and even nonsensical and anomalous assumptions, conjectures, hypotheses, theories, and worlds. For example, would not the notion of "curved space" be analogous to some sort of dream reality from within the Newtonian framework? Curved space cannot be, as far as I know, immediately validated using Newtonian principles and by means of empirical evidence. But then, neither is the statement, "The universe is a machine," from within the twentieth century physicists framework. Nor, "The sun is the center of the universe," from within the Ptolemaic world-view. Nevertheless, from within a particular scentific world-view each of these statements was believed to be empirically verifiable. Each became, at one time or another, part of public knowledge derived from a set of shared experiences and commonplace associations. In fact, each, in its own way, has constituted the corner-stone for the fabric of a particular culture-bound body of knowledge.

Consider once again the machine model. Invented at the outset as a fiction by means of which to account for the universe, it became, as Capek tells us, properly embedded in the consciousness of all relatively aware inhabitants of post-Cartesian and Newtonian cultures. It became intensionalized, a part of common sense reality and commonplace associations which were accepted habitually, tacitly and unquestioningly: *involuntarily suspended disbelief.* However, it is now "common knowledge" that anomalies eventually cropped up in the Newtonian framework ultimately leading to a new world-view from within which the machine metaphor was now looked upon as a fiction, mere illusion. It was now conceived that the universe was not a machine at all; on the contrary, it was, and still is due to the inevitability of a "semantic lag," slowly being viewed as a universe of becoming, of the continuous emergence of novelty in which no event is simultaneous with two other events and all events are relative to one another. Such an "awakening" into a new "reality" can be, when considering an individual, a scientific community, or even an entire society of individuals, none other than a broad-based and totalizing analogical act.

In essence, then, the analogical act by means of which, at a microlevel, new SS-system entities are created, or which, at a macrolevel, new world-views are acquired, follows the same mechanism for all creativity, whether artistic, scientific, religious, or whatever. This mechanism is also, I would conjecture, the same for dream realities, hallucination, and all purely imaginary constructs. Now let us consider the ultimate implications of what I have asserted in this subsection.

3.33 *All analogical acts have common roots: a potentially infinite range of possibilities.* Consider further the nature of dream realities and hallucinations. A dream world is as real from within the dream state as our ordinary waking life world from within our set of sense perceptions. Within the dream reality it appears that virtually everything is possible and everything is potentially valid. In fact, it is not merely a dream world when viewed from within the dream; it is The World. In this dream world situations which would ordinarily be absurd, irrational, paradoxical, and ambiguous can, with no apparent problem, coexist. The important point is that the incommensurability between dream worlds and the "real" world is available to consciousness only *after* the event, while in the waking state. Only then can the dream be considered *as* a dream rather than *as* "real" (Malcolm, 1959; Melhuish, 1973).

Viewed in this larger perspective, the juxtaposition of such divergent frameworks as dream realities, imaginary artistic constructs, and relatively incommensurable scientific world-views reveals that *all things are potentially possible.* What is absurd within one framework can be logical within another, what is paradoxical in one can be empirical truth in another. Admittedly, dream realities are irrational juxtapositions of elements. We try not to take them seriously, for we know they are not "real." But in the beginning all analogical acts are, to a greater or lesser degree, irrational juxtapositions. And it is remarkable that analogical acts can give rise not only to dream worlds, but to all imaginary constructs. If these imaginary constructs remain in fictive texts they properly retain their status as fictions. On the other hand, when placed in religious, scientific, or in many common sensical cultural frameworks, they can become "real." The final determinant for what is "real" and what is fictional is the framework within which a particular set of phenomena is conceived/perceived.

In this sense it cannot be dogmatically assumed that waking experience or one's empirically perceived world is indefinitely superior to any and all forms of dream reality, hallucination, poetic vision, or mystical insight. This is, I submit, not merely wild-eyed speculation, but a logical and inevitable conclusion when considering broad-based cultural perspectives within a historical context. The slow cultural "awakening" from polytheism to

monotheism, from timeless Greek mythology to historicity, from the Newtonian mechanistic universe to Einsteinian relativity, and so on, is indeed an "awakening" into a world which, centuries or even generations before would have been mere illusion, dream. Moreover, dreams, hallucinations, and all imaginative constructs such as metaphorical language and scentific models, exist on an equal status at the precise moment of their conception. In this instant, during the analogical act, a model conceived for scientific use in accounting for a part of the world does not necessarily have more ontological status than a dream image. If we deny dreams any ontological status, we must, from a broad perspective, deny any form of ontological status to any and all world-views. For instance, if the Newtonian states dogmatically that a world like the Einsteinian world can be no more than a dream reality (i.e., that it is absurd, nonsensical, irrational, or meaningless) he is automatically stating that neither dream reality nor the Einsteinian world can possess any ontological validity. Consequently, he is also denying any form of possible change in his or any other conceptual framework (see Melhuish, 1973).

Hence, what were once conceived as chimerical and even insane interpretations of the world have become acceptible, later dogmatized: sets of commonly shared experiences. That alone must be accepted as proof that they *were possible* and that ontological status for them *was potential.* The problem is that according to the commonly held belief in the modern world of a noncontradictory reality, the hard-line view persists that dream, hallucination, poetic experience, religious mystical experience, etc. occur in a domain which is incompatible with the "real" world, that they are nothing more than emotional, subjective, or psychic nonsense. Thus far I have placed these activities on the same plane as scientific creativity. Now I must further illustrate my assertion.

3.34 *The boundless framework.* Consider a thought experiment: the process of conversion from one religion to another. x is told by a well-meaning missionary, y, that he must suspend disbelief in order to accept the truthfulness of y's faith. This request presupposes that x can unsuspend suspension of disbelief in his own religion, R_1, and then proceed to suspend disbelief in the new faith, R_2, and at the same time passively receive it. However, at that precise instant after unsuspending disbelief in R_1 and before suspending disbelief in R_2 he must be "suspended" in some kind of "limbo" between them. He cannot be still inside R_1, for if so, then he could not at the same instant in time suspend disbelief in R_2. And he cannot be properly inside R_2, for if so, then his transference of belief would be an accomplished fact; he would possess no free agency to choose between R_1 and R_2 after instantaneously unsuspending disbelief in one and suspending disbelief in the other.

But he must be either in R_1 or R_2 or in that "limbo," a sort of *meta-paradigmatic frame* (MPF), which can only exist outside R_1, R_2, and outside all particular belief systems and CFs. And an unlimited range of possible juxtapositions in this MPF must possess a form of potential for becoming ontologically valid.

Why is this so? If *x* temporarily believes either in R_1 or R_2 he of course believes in something. If, however, during that split moment after he unsuspends his suspension of disbelief in R_1 and before he suspends disbelief in R_2, he exists in this postulated MPF, then it still cannot be said that he believes in "nothing." Even to believe in such a "nothing," if indeed the postulated MPF can be construed as "nothing," would be in itself a belief in "something." And that "something" may not necessarily be actual but at least it is a potential. *x* is not and cannot be at any time in no framework; he must be either in R_1, R_2, or "instantaneously" in MPF. Total absence of any particular perspective has to be either a total perspective – an impossibility according to the epistemology but forth in this study – or total lack of perspective – death.

Now, to unsuspend disbelief in R_1 would be to admit to the *possible* truth-value of either R_1 or R_2, or something else in the *possible realm* of the MPF. Consequently, when *x* "instantaneously" places himself in the MPF by assuming that either R_1 or R_2 is possibly true, he is simultaneously opening himself to a potentially infinite range of possibilities. Naturally if *y* is an effective evangelizer *x* will undoubtedly be led in the direction of R_2. Yet while *x* is "instantaneously" inside the MPF all possibilities are potentially before him – although, of course, he is capable of choosing from no more than a limited number of those possibilities at a given instant in time. These possibilities include the set of all recombinations of SS-system entities from within his CF. However, if he denies all of these possibilities except those that correspond to R_1 and R_2 he can, by recombining actual and potential SS-system entities from within his CF and by attaching new meanings to them, transfer his belief system to R_2 and consequently his CF will be altered radically. Then and only then can it properly be said that he has or has not been "converted" (see also Merrell, 1982, for further development of this topic).

It follows, then, in light of the previous subsections and from the functions of the (~P & ~Q), (PI & QI), and (~PI & ~QI) perceptual modes in TRANSFORMATIONS (I)-(IV), that:

PROPOSITION VII: There exists a meta-paradigmatic framework, MPF, from within which the construction/perception of potentially infinite SS-system variability over time is possible by means of recombinations of actual and potential SS-system entities.

And:

COROLLARY V: The infinitely extensible frame, MPF, is coexistent with all possible intra-SS-system and inter-SS-system "switches" by means of transformations between the perceptual modes in Figure 16.
COROLLARY VI: The MPF is coexistent with dream reality, poetic flights of imagination, mystical religious experiences, scientific or mathematical creativity, and all analogical acts, be they of minor or major proportions.

Following from PROPOSITION VI, the existence of the MPF put forth in PROPOSITION VII and COROLLARIES V and VI is a necessary condition in order to account for the potentially infinite variability over time of SS-systems in texts.

3.4 The Two Axes of Organization

3.40 Consider the following proposition which consists of the second universal substantive property inherent in all relatively sophisticated and relatively complex texts:

PROPOSITION VIII: All SS-systems in texts are, with respect to their general semiotic framework, constructed/perceived along two lines: *sequentiality* and *parallelism.*

In support of PROPOSITION VIII I will first discuss a general hypothesis of cognitive processes, then attention will be turned toward a possible mechanism with which informally to account for the construction/perception of novelty in texts at the level of individual SS-system entities. Hence: PROPOSITION VIII at the local level complements PROPOSITION VII at the global level, and PROPOSITION VIII is to the textual "surface" level as PROPOSITION VII is to the "macromolecular" level.

3.41 *Analysis-by-synthesis as a general model of text perception.* A basic assumption underlying many recent studies in cognitive psychology is that remembering and thinking are governed by a mechanism similar to that which governs written language and speech perception. Models such as "analysis-by-synthesis" (Halle & Stevens, 1959 & 1964; Katz & Postal, 1964; Neisser, 1967), "hypothesis testing" (Bruner, 1951), "trial and check" (Solley & Murphy, 1960), follow this general line of reasoning (see also Goodman, 1967, on reading). Let us consider Neisser's particular discussion of this model.

If, when reading this page, the reader does not attend to each letter, it is reasonable to assume that her comprehension of speech patterns lies at some "iconic" or "analog" level which is distinct from the "digital" or linear phonemic level of the individual marks on the printed page. Neisser asserts that the minimal "bundle" or "chunk" of information in speech perception or text perception is considerably larger than the phoneme. In fact, he estimates that the minimal "cognitive unit" is usually an entire phrase (see also, for example, Fodor & Bever, 1965; Garret, Bever, & Fodor, 1966; Gibson & Levin, 1975; Levin & Kaplan, 1972; Miller, Heise & Lichten, 1951). At this more comprehensive level the reader creates, while proceeding through the linearly and "digitally" organized text, "analog" or *Gestalt* wholes which encompass successively larger "chunks" of the text. Interpretation at this level occurs by repeated testing, tacit as well as conscious, of expectations that follow from hypotheses concerning what the reader expects to encounter as she proceeds through the text. That is to say, the reader constructs a hypothetical text of her own and attempts to "match" it with the structure of the text she receives. The tentative synthesis of the text which she sets up is "local" at first, and then the pieces are integrated into a larger pattern as incoming information and her conceptual resources and internalized CF permit (recall discussion of the riddle in 3.13, or re-evaluation of the "cigar-phallus" statements in 1.11).

This "matching" may go on at several levels simultaneously: phonemic, morphemic, sentential, etc. depending upon the nature and length of the text. Then the marks-on-paper the reader receives are synthesized until the two structures "fit." If the text consists of a few short statements, after a few words have been tentatively identified, a synthesis may be constructed by the reader such that she actively reconstructs what she hypothesizes to be large textual units or even perhaps the entire text. In this way the reader may manage to "see" words that were not in the text at all (i.e., like the "cloze" procedure; see Coleman & Miller, 1968). Since her synthesis begins before the text is completed, she can also occasionally be "fooled." Subsequently, there can be a dynamic change in her expectations as she progressively assimilates the text (Stevens & Rumelhart, 1975).

3.42 *Analysis-by-synthesis is a two-way reconstruction of the text.* The act of analysis-by-synthesis entails *sequential* (linear) processes of message reception through time, and *parallel* (non-linear) processes of "matching" the whole of the text being received with the text that was hypothesized (see also Paivio's, 1969, 1971, "dual coding" model). This means that when receiving sensory data, either visual or verbal, a subject engages in a one-thing-at-a-time sequential search through the set of alternatives from within his CF in order to locate that "matching" hypothesis

which is parallel to the received text. At the same time, an entire set of potential holistic "matches" are examined in parallel such that alternatives are always present in case the hypothesis is not successful. Parallel processes are not cause-and-effect or linear; they are multiple processes which can lead in many directions "simultaneously." Neisser (1967, 65) provides a visual model of such a situation:

> An array of tuning forks operates as a parallel recognition system for frequency, for example. If a fork of unknown pitch is struck near such an array, it is compared with the whole array at once and 'arounses' only the fork which has a similar resonant frequency.

Parallel and sequential processing is comparable to Polanyi's (1958) two levels of awareness: focal (parallel) attention and subsidiary (sequential) attention – Neisser in fact uses similar terms. Focal attention is the ability to attend to the totality of a given entity, to see it alternately from one angle or the other in *Gestalt* or analog fashion. Subsidiary attention rests on the "bits" making up that entity.

However, according to Neisser, the analysis-by-synthesis construction of sensory input does not give us the entire picture. For instance, with respect to visual perception, the processes of focal attention: "cannot operate on the whole visual field simultaneously, they can come into play only after preliminary operations have already segregated the figural units involved. These preliminary operations are of great interest in their own right" (Neisser, 1967, 89). Neisser calls these preliminary operations the "preattentive process." Constituting in itself a synthesizing activity, the preattentive process is relatively tacit. It is responsible, like the CFs put forth in this study, for generating holistic forms which become the object of selective and focal attention and which later cognitive mechanisms – the sequential and parallel processes – will "flesh out and interpret." The preattentive process apparently has hierarchical depth. For example, Neisser (1967, 89) tells us that:

> On request, you can focus your attention onto a single letter of the page (for example, the *q* which occurred earlier in this sentence). Having found it, you can note whether it is well formed, or how it differs from such letters as *p* and *b*. The preattentive processes keep the *q* a separate and integral unit while you do so. This is an acquired skill, very difficult for young children and illiterates. They must get along with much more crude objects of attention, such as the entire block of print on the page, or the whole word in which the *q* is embedded.

A visual counterpart to Neisser's example is that of the common puzzle wherein two rough sketches of a landscape or some such thing are presented with the information that there are five or six minute differences between them. The object is to locate these differences. At the outset they are not available to perception since the sketch is viewed holistically, in "analog" fashion. We must begin scanning, breaking up ("digitalizing"), and analyzing the parts of the sketches in order to solve the puzzle. After the differences have been pointed out an interesting thing occurs. We can now hardly view the sketches without seeing the differences! In a sense it can be said that we are no longer "illiterate" with respect to the proper "reading" of them. The differences so to speak have now become part of our perceived world. This entire process is analogous to the way that our CF almost-automatically pigeon-holes our perceptions into broad "icons" or "analogs."

3.43 *The parallel process involves embedment and de-embedment.* I have been speaking here of global, holistic apprehensions of the visual field wherein each image is separated in its entirety from all others as a continuous "icon." The embedded preattentive perceptual process by means of which these "icons" are "seen" can be the product of habitual action. Neisser (1967, 92) gives the example of the man:

> who 'recognizes' the familiar signs of his office as he enters in the morning, or notes out of the corner of his eye that his secretary has already come in. Such a man can easily be deceived – the picture on the wall may have been changed, the secretary may be a substitute – and he will be in for a surprise when he notices the deception. His response will then be the redirection of attention, together with appropriate orienting responses, as he focuses on the newly interesting object.
>
> Such a man will probably have a succession of secretaries who rightly complain that he never pays any attention to them. But they will have to admit that at least he rarely collides with them or the office furniture which he takes equally for granted.

Recall the embedment of such activities mentioned in above sections as riding a bicycle, playing a piano, playing billiards. All these activities have become relatively embedded and nonconscious: part of one's preattentive process. Active and conscious piece-by-piece deconstruction and reconstruction of these activities can begin by means of simultaneous parallel and sequential processes, but only when one attends to those activities that were previously nonconscious.

For instance, when the expert billiards player finds himself engaged in a duel with a superior competitor he must attend to and re-evaluate some of his strategies that were ordinarily embedded and automatic. If the piano

player finds that one bar of a piece he has committed to memory was not correct, he must now attend closely to that part of the piece when playing. If a cyclist decides to train for a short-circuit race he must now concentrate on moves which he had previously taken for granted and done, so to speak, without thinking. The reading process is analogous. As the reader learns to "chunk" larger and larger blocks of printed matter, many articles, prepositions, connectives, common adjectives, nouns and verbs, and stock phrases are perceived at a relatively nonconscious level. This "chunked" material becomes part of his expectations. It can then be made available to his conscious attention only by an effective surprise, when his expectations are unfulfilled. And such surprises are most effectively brought about through the appearance of textual novelty: unique SS-system entities.

3.5 Metaphor and Metonymy Revisted

3.50 Now let us turn to the construction/perception of individual SS-system entities by re-evaluating the role of the *sequential* and *parallel* modes of organization at the local level. I must mention at the outset, however, that two important points are to be observed. First, the sequential-parallel processes described above are presumably applicable for most or almost all human activities. In this section, on the other hand, I will direct attention exclusively toward the process of SS-system construction/perception. Second, consideration of SS-systems entails the extra-linguistic level, the "secondary modelling system." Hence the linguistic terms I appropriate are not necessarily relevant to language phenomena, at least as they are used in the context of this inquiry.

3.51 *The local level of SS-systems is bi-axially organized.* Consider *sequentiality* in light of what has in structuralist circles been termed "metonymy," and consider *parallelism* in light of what has been termed "metaphor." According to Jakobson (1956), all linguistic signs involve two modes of arrangement: *combination* through contiguity, or metonymy (analogous to Freud's displacement) and *selection* through similarity, or metaphor (analogous to Freud's condensation).[3] Postulating this fundamental dichotomy, Jakobson (1956, 81) claims that an incessant competition between these two rhetorical devices "is manifest in any symbolic process, either intrapersonal or social."

In a rather superficial sense combination, like sequentiality, is a linearly organized set of constituent parts (i.e., sentences, words, phonemes, etc.). And selection, like parallelism, implies the possibility of substituting one item in the message for another one from the range of potential items existing

simultaneously in the code. However, let us look deeper.

3.52 *At the local level, bi-axial organization is cognitive before it is linguistic.* Elsewhere (Merrell, 1976a, 1976b, 1976d, 1978a, 1978c) I have extrapolated from the structuralist model of metaphor and metonymy a general mechanism with which to describe what in this study are called "switches." For example, in certain subcultures in the United States during the 1960's, "policemen" figuratively became "pigs." This constitutes an addition to the other associations ordinarily related to "pigness." "Pig" is also included along with the growing melange of metaphors customarily attached to policemen. This phenomenon can be described in structuralist terms as a *signifier* ("policemen") which is displaced by another *signifier* ("pigs") according to the following:

Figure 18

In other words, to paraphrase Jakobson (1960) the metaphorical axis of selection is projected into the metonymical axis of combination. However, I believe Jakobson's model and my earlier formulations are atomistic and overly restrictive. As I have argued, SS-system entities are not merely linguistic entities. Construction/perception of SS-system entities occurs by means of a particular CF which entails a general cognitive mechanism (and a cognitive capacity which includes linguistic capacity as a member). Moreover, SS-system entities cannot be isolated from their contexts. That is, they are not adequately intelligible on a one-to-one basis; they interact with all other entities in the entire system in which they stand. They make up, in concert, an interconnected fabric, an intricate set of clustered *semions* and *symbols*.

For example, from a broader framework, while the transformation is occurring in Figure 18, an entire sequential and parallel set of terms related to "policemen" undergoes an expansion. On one level and according to socially accepted conventions, a policeman can be referred to sequentially or metonymically as a badge ("copper"), the "law," etc. and he "enforces," "protects," etc. good citizens. On the new level of signification the badge becomes along the parallel axis metaphorically a "shield," the law becomes

"authority," etc. and the "policeman" "represses," "threatens," etc. Hence the following schema:

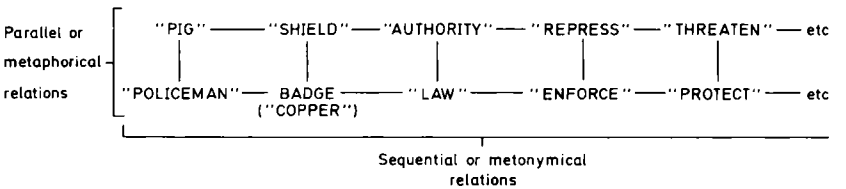


Figure 19

Notice that I do not use metaphor in the traditional sense of some similarity between one lexical items and another. Although lines of correspondence can be established between, for example, "pig" and "policeman," this certainly does not appear to be the case with respect to "threaten" and "repress." The latter two terms, if considered outside the system, are most likely to be considered as opposites rather than similars. Nevertheless, when placed within the system, "threaten" is connected sequentially to "pig," which in turn is related on the parallel axis to "policeman," and "policeman" is linked sequentially to "protect." Although not metaphors in the ordinary sense, then, "threaten" and "protect" are nevertheless connected by "negative" or "differential" metaphorical relations. That is, "protect" is to "policeman" what it is *not* to "pig," and "threaten" is to "pig" what it is *not* to "policeman." This assertion implies that in order properly to conceive/perceive a metaphor entails knowledge not only of what a thing is like, but also what it is *not* like (this will be discussed further in Appendix II).

Notice also that as we proceed from left to right the terms progress from relatively precise lexical entities, which refer to specific items in the empirical world, to general abstract concepts. This indeed is significant. At any moment we possess, or we can retrieve from memory certain distinct SS-system IMAGES which have been derived from previous more general, more abstract, and less conscious IMAGES, and these are derived from others which are still more general, and so on (i.e., Peirce's "indefinite semiosis").

Moreover, this process can be described with the model proposed in 3.21-3.24. In order to do so, let us first review the process of transforming a lexical item into an SS-system entity. In light of statements (1)-(3) from Part 1, we can set up the following progression:

(14) A "policeman" is a policeman [*naming* – a tautology].

(15) A "policeman" is a "copper" (the "law," etc.) who "enforces" ("protects," etc.) [*describing* – with socially accepted literal and figurative commonplace associations].

(16) A "policeman" is a "pig" [*semionization-symbolization* – outside the predominant socially accepted commonplace associations].

Naming is necessarily a metonymical operation (by contiguity) – or, in alignment with Saussurean linguistics, it can be related to the syntagmatic axis. *Describing,* on the other hand, entails what are presumably figurative as well as nonfigurative (metaphorical as well as metonymical) terms outlining the properties possessed by the object, act, or event in question. Statement (15), therefore, consists of the set of commonplace associations derived from within the CF of a given subject who participates in a given form of life. For a subject whose form of life and CF are slightly to radically distinct, the commonplace associations are necessarily something other than what they would customarily be in the larger or dominant culture. Statement (16) is an example of such associations (with respect to commonplace associations see Black, 1962; see also Appendix II).

In this light it can be said that from outside the commonly prescribed set of associations, this subject generates a distinct set of associations from within her (~PI & QI) preceptual mode. Consequently, she is critical of the dominant set of commonplace associations from within (P & ~Q). Her creative construction of a new SS-system entity, "pigs = policemen," must therefore be derived from some other source, perhaps in this case part of her embedded body of culture-world knowledge, the (~PI & QI) mode. Thus we have the following transformation:

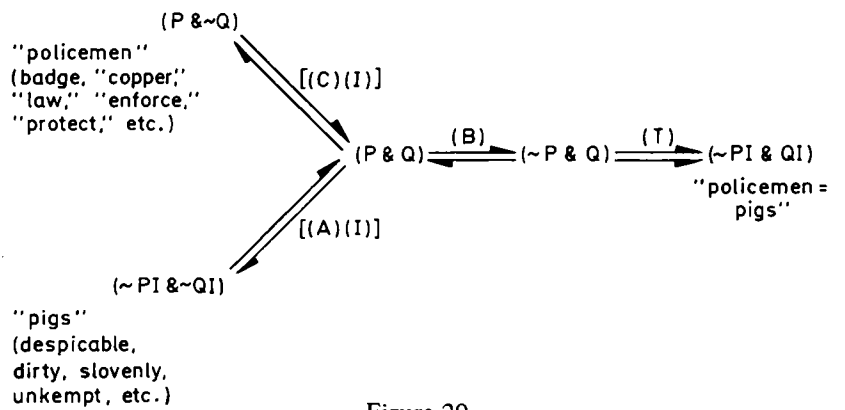


Figure 20

Such transformations are coherent with the Peircean view according to which no sign can be self-sufficient or self-confirmatory: all signs are related to other signs. In this sense, the extension along the sequential chain in Figure 19 from concretion to abstraction, and from consciousness to tacitness,

represents a given aspect of the potentially endless network of signs and their representation by means of which the semiotic system can only explain itself by itself. Such a regression in any semiotic system proceeds from explicit linguistic signs adequately explainable by dictionary knowledge to partly implicit *semions* and *symbols* which are intelligible only tacitly and through culture-world knowledge. This supports the above argument that there is no all-or-nothing boundary between linguistic entities and SS-system entities, or between knowledge of language and knowledge of culture-world. With respect to SS-systems and texts, then, metaphor and metonymy cannot be adequately accounted for with a linguistic model only.

Hence, the above described parallel-sequential and "metaphorical-metonymical" processes go beyond linguistics, strictly defined, to include SS-systems, extralinguistic cognitive processes, and culture-world knowledge. That is to say, the parallel-sequential and "metaphorical-metonymical" processes make up a more general semiotic process.

Consequently:

DEFINITION 3-I: *Parallelism* and *sequentiality* (complementary cognitive modes of organization) are homologous with *metaphor* and *metonymy* (complementary modes for organizing and arranging SS-system entities from lexical items).
DEFINITION 3-II: *Metaphorization* entails the establishment of relations of interaction and interdependency between SS-system entities which are conceived/perceived to be similar with respect to some of their attributes.
DEFINITION 3-III: *Metonymization* entails the establishment of relations of interaction and interdependency between contiguously related SS-system entities or between an SS-system entity and some of its properties (with respect to DEFINITIONS 3-II & 3-III see Appendix II).

With the above in mind, let us continue discussion of textual "switches" at the local level in order more adequately to account for the role of individual SS-system entities in broad-based textual "switches." Such discussion is necessary, since global level "switches" must be derived from one or more local level "switches."

3.53 *During the reading of a text, the appearance of novel items of experience by means of a "switch" occurs at a point where the SS-system is "distorted."* I argued in 0.13 that the "negentropic" process within a CF is from ordered simplicity to organizational complexity. This process carries a given internalized CF and the SS-systems it generates toward completion; that is, toward adequate explicitness such that the SS-systems and texts generated from it are more fully and precisely explaibable. But, of course, a CF can never be completable nor wholly consistent. Hence with higher

levels of organized complexity, inconsistencies (or paradoxes) invariably crop up. At a certain point the increased number of inconsistencies represents a "distortion" which overrules the possibility of further complexification, for to continue, a state of chaos might ensue. Hence the "switch" to an alternative CF can occur. The alternative CF at the outset appears relatively ordered and simple, and the process of complexification begins anew. Cognitive development operates, therefore, on continuous and discontinuous levels. In light of the preceding section, then, it can be stated that development is evolutionary and continuous – albeit with minor local "switches" – within one CF; and it is global and discontinuous when "switches" occur from one CF to another.

So it is with a radical "switch" in the perception of texts. A "distortion" in the SS-system of a given text represents a point where the lines of interdependency and interaction between all SS-system entities is subject to minor or major change. This "distortion" is the result of an accumulation of tacitly or consciously perceived inconsistencies. Novelty appears at a "critical point" in the text and "instantaneously" the perceptual mode undergoes a radical transformation. The transformed meanings applied to the key SS-system entities at the "critical point" potentially effect all the entities in the system, and the entire system undergoes minor to major reorganization. Such reorganization is coordinated with the reader's CF, but on rare occasions, it may compel him to reject his internalized CF and replace it with another relatively incommensurable scheme. This reorganization is possible by means of CF, SS-system, or SUBLANGUAGE "switches" as a result of transformations like those put forth in 3.26.

Adequate text perception, then, requires that what was ordinarily implicit become potentially explicit. If textual "switches" demand reorganization of the lines of interdependency and interaction between all SS-system entities in the text, then this implicitness made explicit occurs as a result of such reorganization. In this sense and in view of PROPOSITION VII, we have the following:

COROLLARY VII: SS-system "switches" are the product of interdependency and interaction between the parallel (metaphorical) and sequential (metonymical) lines of SS-system organization.

It is axiomatic that the "flash of insight" or "switch" when one suddenly comprehends some aspect of a text must occur at a particular but indeterminable point. Moreover, in light of the conclusions in 1.3 concerning embedded culture-world knowledge, it can be inferred that although this particular point is indeterminable, it must come about by means of the postulated

general cognitive mechanism for constructing/perceiving variability in SS-systems.

3.54 *The existence of indeterminable and uncontrolled "switches" implies an underlying textual reality.* I will illustrate the interdependency-interaction in COROLLARY VII by the following assertions which entail a synthesis of many previous arguments.

Consider texts as systems of norms and transformations of norms (see Barthes, 1974; Kristeva, 1970). Transformations of culture-bound, language-bound, and *Weltanschauung*-bound norms in texts occur by means of a universal cognitive mechanism (cf. PROPOSITIONS I-III). Texts can be perceived in two ways: "empirically" in terms of the surface meaning of their signs, or, they can be perceived at the "macromolecular" level; that is, at the level of the underlying textual "para-reality" (which is complementary, in terms of parallelism, with the textual surface). The textual "para-reality" consists of, if we proceed from literary to scientific texts, allegory, irony, myth, ideology, "root metaphors," presuppositions, models, axioms, etc. (see in general, Buchanan, 1932, 1962; Kuhn, 1970; Laszlo, 1972; MacCormac, 1976; Pepper, 1942; also, recall PROPOSITION IV). Moreover, this "parareality" contains what I will call the textual "world model" (compare to Goldmann's, 1964, idea of a "world vision" underlying texts). Only partly explicit, this "world model" is ordinarily perceived at tacit and nonconscious levels.

All text systems contain, to a greater or lesser extent, a set of "SS-clusters": condensed "nodes" of figurative meaning, through sets of SS-system entities, which underlie the linear surface structure of the text (compare to Kintsch, 1974). SS-clusters imply a set of presuppositions which potentially reveal, with an inevitable degree of vagueness, ambugity, and incompleteness, the text's fundamental "world model" and the corresponding CF it in part portrays at the level of the "para-reality." Since the textual "world model" is partly nonconscious and usually only tacitly perceived during a reading, there invariably exist hidden premises which are potentially revealed only by de-embedment of *semions* and *symbols* in the SS-clusters not previously available at conscious levels (cf. PROPOSITION V).

The textual SS-clusters and their corresponding "world model" are usually (in part consciously and in part nonconsciously) perceived from the (~PI & QI) mode if they are believed to be "true," or from the dogmatic (PI & ~QI) mode if they are perceived as "false." From (P & ~Q) or (PI & ~QI), they can also be perceived with doubt, skepticism, etc. In such case textual novelty may be perceived through transformations from (~P & ~Q), (~PI & ~QI), or (PI & QI). If the reader accepts this novelty he attempts to incorporate it into his internalized CF. If not he rejects it

as "false" from the dogmatic (P & ~Q) mode (cf. 3.24-25).

All relatively sophisticated and relatively complex texts potentially contain one or more "critical points": (a) where the "distortion(s)" exist(s) at the level of the "para-reality" and through the SS-clusters, (b) where intra-SS-system and inter-SS-system "switches" can potentially occur, and (c) where the text is potentially de-embedded (cf. PROPOSITION VI and Part 2). Key SS-system entities directly connected at the critical point(s), where novel items of experience potentially emerge, create the possibility for a "switch." However, such a "switch" is actualized only for the reader establishing the necessary relations between SS-system entities along the parallel and sequential axes and by means of these SS-system entities. (cf. PROPOSITION VIII).

The addition of new meaningful SS-system entities to what the reader has already perceived in a text may simply indicate the more-or-less continuous aggregation of additional data. In this case the underlying "world model," which is primarily tacitly perceived, remains unchanged. On the other hand, if these new SS-system entities create a distortion they can constitute a new convention of *semionization-symbolization* pointing toward a fundamental discontinuous change in what the reader has perceived to be the text's underlying "world model." This new convention of *semionization-symbolization* represents an internal reconstruction device, the general cognitive mechanism, which is capable of reconstructing a potentially unlimited number of underlying forms and processes to be ultimately translated into the surface of a potentially infinite number of possible text systems (cf. PROPOSITION VII and COROLLARIES III-VI). This transition from one textual "world model" and its corresponding CF to another is a discontinuity which, when mapped into/onto the surface of the text, may be perceived as a continuity. Hence change of the underlying textual "world model" may not be consciously perceived by the reader although tacitly acknowledged (cf. COROLLARIES I and II).[4]

The process of text perception just described involves a fusion of the two axes where metonymy may be temporarily perceived as metaphor or metaphor as metonymy such that the textual "world model" becomes polysemious, with rhetorical, ideological, aesthetic, cultural, etc. connotations leading in multiple directions. This phenomenon accounts for what Barthes (1974) refers to as a plural reading, Eco's (1962) "open work," Metz' (1974a) multiple interpretation of the cinema, or the element of "free play" in the literary text suggested by, among others, Derrida (1970) and Kristeva (1969). It also accounts for Feyerabend's (1975) "proliferation" of scientific theories, and Popper's (1962) "open society." Moreover, the meta-paradigmatic framework (MPF) I described in 3.3 is inherent in all of these notions.

In sum, potential awareness of the textual "world model" exists by virtue of parallel-sequential (metaphorical-metonymical) interdependency and interaction. Expectations derived from the analysis-by-synthesis process set the stage for an SS-system "switch" by means of which that interdependency-interaction and that textual "world model" can be revealed. Parallel-sequential interdependency and interaction can play a dual role in the literary text, especially relatively complex prose works. The reader may directly perceive ambiguity, anomaly, or paradox with respect to the general "world model" implicit in the text itself, or he may perceive it vicariously through the eyes of one of the characters. In the two sections that follow I will informally analyze two literary texts, a section in Carlos Fuentes' novel, *The Death of Artemio Cruz* (1964) and Jorge Luis Borges' short story, "The Circular Ruins" (1964) in an effort to illustrate these processes. My intent will be to show how a character in each work confronts a contradictory or paradoxical situation with which she/he cannot cope. The reader interested in proceeding directly to the formal model of SS-system and text system construction/perception can omit these sections and go to Part 4.

3.6 Communication and Paradox: Carlos Fuentes' *The Death of Artemio Cruz*

3.60 Fuentes' *The Death of Artemio Cruz* (1964) represents an ambitious effort to synthesize through one character's life the entire history of Mexico, especially from the Revolution beginning in 1910 to the latter 1950's. One of the predominant themes in this novel is choice. Choice determines future range of possibilities by eliminating the range of other possibilities that would have been open had alternative choices been exercized. Artemio Cruz, the protagonist of Fuentes' novel, inextricably confronts a field of choices at each stage of his life, and on choosing, the impending actions not only effect himself but also those around him (see Sommers, 1968). Fuentes seems to suggest that to choose is potentially to survive and to survive is to "sacrifice" others. However, Fuentes also reveals a more profound problem. Most of the choices in the novel are invariably exercized between two alternatives which ultimately lead to contradictions or paradoxes on semantic and existential levels. On the basis of this assertion, my objectives will be: (a) to analyze two parts of the novel dated May 20, 1919 and June 3, 1924, which reveal an "existential paradox" arising from the confrontation between Artemio Cruz and his wife Catalina, and (b) to suggest that this "existential paradox" stems from complementary "semantic paradoxes" (this follows PROPOSITION VI in 3.1).[5]

3.61 The first of the two above-mentioned parts of Fuentes' novel gives account of how Artemio, a hardened opportunist from his experiences in the Mexican Revolution, arrives at the decaying *hacienda* of Don Gamaliel Bernal. Artemio knows of Gamaliel through his son Gonzalo whom he met in a dingy prison during the Revolution and left to die while negotiating for his own freedom. Aware that he can take advantage of the old man's weak position, Artemio talks to townspeople and to the local priest in order to determine his course of action, and then ruthlessly bargains for Gamaliel's land and for his daughter Catalina.

From this point the conflict begins. Catalina, with her "woman's intuition" knows that Artemio was somehow responsible for the death of Gonzalo, an assumption her father had considered, pondered, and finally discarded since he realized that only in this ambitious young man might there be a partial salvation of his coveted position in Post-Revolutionary Mexico. Catalina, in contrast to her father, thoroughly despises this "monster" who knows everything and has the power to destroy all. Yet she is caught up in a dilemma. She believes she must somehow avenge her brother's death and at the same time feels she must honor her father's wishes by marrying this loathful stranger. Catalina concludes that: "She could avenge her brother's death . . . only by embracing this stranger, embracing him but denying him the tenderness he would like to find in her. She would murder him living, distilling bitterness until he would be poisoned" (Fuentes, 1964, 48).

3.62 *The resolution simultaneously to embrace and to deny entails a fundamental contradiction in Catalina's conception of her world.* Catalina resolves to be strong against Artemio, but in his presence she comes to experience only the "strength" of her "weakness." Her position consequently is that of "helplessness" with "rancor." Although responsibility to her father would apparently negate possible happiness for herself, she feels obligated to honor his request that she marry Artemio with passive "resignation" while nurturing an inner self-confidence that ultimately she will play the role of aggressor and her "sacred revenge" will be consummated. She must hate her adversary in order to comply with the original plan, but she soon begins to ask herself whether he loves her and whether she should allow herself to love him. Past certainty becomes present incertitude.

3.63 *This pattern of semantic contradictions describing Catalina's state of mind is condensed into two conflicting images: NIGHT/DAY and BODY/SOUL.* The nights are characterized by Catalina's weakness, by her progressive lack of resistance to Artemio's advances, and by her failure to honor the secret covenant she made with herself. Yet even though Artemio conquers by night, her own "triumph" begins at the break of drawn: "By night she would let herself go, let herself desire and respond to desire. But when she

woke in the morning, she remembered the beginning, and once again would oppose his strength with her silent rancor" (Fuentes, 1964, 97). Concomitantly, the fracturation of her life into night and day is complemented by the antithesis between *material desires* and *spiritual intents.* At the wishes of her father she believes she was compelled to "sell" her body, but not her soul; how she must maintain body and soul in eternal separation, and the latter must preserve constant vigilance over the former. Catalina rationalizes that: "perhaps her body was not the work of God but that of other bodies, but . . . her spirit was God's. She would not allow her body to take a road of spontaneity and delight, hungry for caresses, if her spirit dictated otherwise" (Fuentes, 1964, 49). In other words, she does not erect defenses against the loss of her body; that is unimportant. Rather, her entire effort is directed toward preservation of her SOUL.

Hence Catalina at the outset remains aloof from her husband's rapidly changing world (the new post-revolutionary order) and lives only for her trips every two weeks to her father's new residence in a provincial city where she can keep alive the nostalgic world of her childhood (the old order). On the other hand, during the first few years Artemio remains indifferent to his wife's coldness. He lacks time to concern himself with her world, that secondary world he controls but which he does not understand and into which he does not fit. It is after Catalina's father dies and the only world she had lived for ceases to exist that her former coldness and passive resitance weakens and she becomes increasingly submissive to Artemio. Less secure of herself, she allows Artemio to seduce her and begins to enjoy the nights with him. She is aware that during those moments of pleasure the reason for her hatred is temporarily forgotten, and consequently resolves to allow herself physical pleasures solely during the night while imposing on Artemio an intransigent hatred and silent rancor during the day. She tries to forget the nights, to assert, as she lights a candle and prays in silence each morning, that she had not been conquered in the weak hours of darkness. That is to say, it was not her soul (self) that enjoyed sexual relations with Artemio, only her body. Although it appears that night and day represent for Catalina two separate modes of existence, in reality her nocturnal affairs continue to emerge in her conscious memory and haunt her during the day while at night the project to realize her "sacred revenge" wanes.

On the other hand, Artemio's strength offers Catalina a strange but frightening adventure, an invitation to "the unknown, to plunge into an uncharted future where nothing was made safe by familiarity" (Fuentes, 1964, 97). Placing her own motives in doubt and speculating on the possibility of happiness with Artemio, a choice is forced upon her: Gamaliel or Artemio, hatred or desire, vengeance or passion. She must decide. But,

raised up under the old order of absolutes where all choices are ready-made, she is not accustomed to making such decisions. Catalina now lives in post-revolutionary Mexico, a dynamic milieu where aggressiveness, spontaneous decisions, and the assertion of one's will over others is a *conditio sine qua non* for survival. This is of course Artemio's world which attempts to impose on Catalina, with ever-increasing violence, a new code of conventions.

3.64 *One basic problem with Catalina's view of the world lies in her failure to distinguish properly between levels of abstraction.* Catalina assumes that her choice rests at one level while in reality it must be decided upon at another level. Basically she does not realize that *all choices are not simply binary;* they tend toward organizational complexity. Lower organisms possess the capacity of choice, but these are merely choices between this or that, choices that require "concrete exemplification." On the other hand: "Human intelligence can conceive of a type of things in abstraction from exemplification. The most obvious disclosures of this characteristic of humanity are mathematical concepts and ideals of the Good – ideals which stretch beyond any immediate realization" (Whitehead, 1961, 194). The problem is that in ideals of perfection exactness is usually demanded. Consequently, ideal concepts (derived from CFs) tend to force one's world of experience into dogmatic molds of ideal perfection. Such dogmatic molds inevitably lead to, as in the case of Catalina, the atomization (oversimplification) of messages, of CFs, and of social relationships. They constitute temporarily closed systems which are inevitably self-referential (DEFINITION 2-III), either incomplete or inconsistent (DEFINITION 2-IV), and breached only at meta-levels (PROPOSITION VII). Catalina is incapable of moving to the meta-level because she cannot properly distinguish between the levels of abstraction she has constructed in her conceptual system.

When speaking of Catalina's failure effectively to maintain such a distinction, I refer once again to Russell's Theory of Logical Types (cf. 2.2). In so doing I will attempt to show that Catalina's paradoxical situation stems: (a) from a rupture of the boundary between what she conceives to be two classes of things, and (b) from an inability to engage in a discourse with her husband *about* their relationship and the verbal interactions between them; that is, a failure to metacommunicate.

3.65 *Catalina creates for herself two classes of behavioral modes: that which is prescribed versus that which is non-prescribed* (see Figure 21, below).

It has been established that Catalina's prescribed modes of action (to honor Gamaliel, to avenge Gonzalo, to hate Artemio) conflict with that which was not prescribed (the willing surrender of her body, her enjoyment during the nights, and what she conceives of as her physical desire for

Artemio). The prescribed and the non-prescribed actions correspond to the oppositions Fuentes sets up stylistically between NIGHT/DAY and BODY/SOUL (or the SPIRITUAL and the MATERIAL).

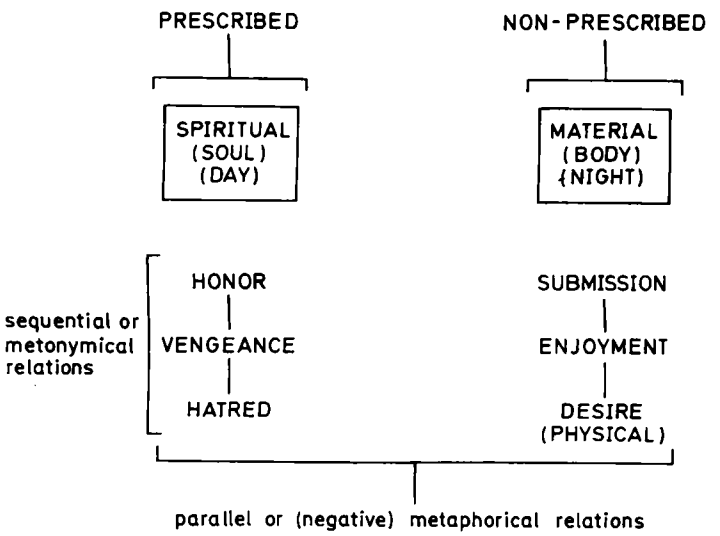


Figure 21

Thus it appears at the outset that the two columns in question pertain, according to Catalina's conception of the world, to distinct classes. The first exists at the level of ideal projection, the second at the level of concrete (physical) reality. The non-prescribed categories are represented by the "body" the pleasures of which she must resist, and hence she "concretizes" these categories. At the same time she depersonalizes and abstracts herself, identifying the self (soul) with the prescribed categories. However, in reality the boundary between the two columns separating Catalina's world into separate "logical" types is a fiction; Catalina erects it in order to carry out her "sacred obligation." On dividing her life into "two modes of existence," she establishes a dissociation between body and soul wherein the detached "body" is looked upon with scorn and hatred as the embodiment of prohibitive actions. The function of the "spiritual" aspects of Catalina's existence consists of control and criticism of that which the body experiences. The "soul" is precluded from having direct relationship with things and with people; it is alienated. Significantly, Catalina's division of her world into

BODY/SOUL, NIGHT/DAY, etc., can be construed as analogous to what Whitehead terms the "bifurcation of nature"; that is, the Cartesian body-mind dualism with all its metaphysical implications which have become endemic to our thought processes.

It is noteworthy that a similar scission between soul and body-world constitutes the core of Laing's study of schizophrenia and everyday existential conflicts in contemporary societies. This cleavage: "disrupts the normal sense of self by disembodying the sense of 'I.' The seed is thus sown for a persisiting running together, mergeance, or confusion at the interface between here and there, inside and outside, because the body is not firmly felt as me in contrast to the not-me (Laing, 1965, 175). According to Laing's scheme, our Western World view of reality with its inherent body-mind dualism forces us nonconsciously into breaching the boundary between SELF-BODY and WORLD such that the BODY exists contiguously with the WORLD and in opposition to the SELF. Consequently SOUL-I-HERE-INSIDE constitutes a set of compatible terms which contrast with BODY-WORLD-THERE-OUTSIDE. In Catalina's case the prescribed modes of action correspond to the first scheme while her non-prescribed actions belong to the second. In order presumably to avoid a paradoxical situation Catalina must maintain strict delimitation between those items which correspond to the prescribed categories and effectively exclude those which are non-prescribed. But this is *ipso facto* an impossibility since she has falsely separated BODY and SELF.

3.66 *Catalina creates a rupture of the frame which for her should "logically" separate those categories belonging to SOUL and those belonging to BODY.* When Catalina discovers to her repugnance that with the passage of time she not only willingly submits to Artemio but enjoys her physical relationship with him and comes to creave his affection, the physical desire she originally was to abhor begins (metaphorically) to displace her projected "spiritual" desire to carry out her "sacred revenge." She now confuses what was conceived to be "animal lust" for Artemio with the other desire, that desire which was included within the prescribed order of things. The clear-cut distinctions Catalina previously established between categories begin to fade. Consequently, Artemio now (metaphorically) embodies, apparently against her will, part of what is prescribed and part of what is non-prescribed. However, Catalina with her either-or mind appears unaware of this turn of events.

Catalina's paradoxical situation can be illustrated by the following pair of explicit propositions:

(a) Catalina now (metaphorically) desires Artemio Cruz though she resolves never to love him and to keep him in an alienated state.

(b) Catalina desires Artemio Cruz but she despises herself because of it.

Propositions (a) and (b) imply two more partly implicit propositions:

(c) Catalina desires (physically) but does not love (spiritually).

(d) Catalina desires but (metonymically) attempts to maintains her physical body in alienation: it becomes part of the world but not part of herself.

(c) represents in essence nothing new to the average reader. It is easily inferred from within the Judaeo-Christian cosmological framework. (d) is paradoxical in conjunction with (b). Catalina can desire (physically) if, and only if, her body is part of her self, and, according to her conception of things, her body can be a part of her self if, and only if, she does not desire. However, (d) implies a further statement which is presumably nonparadoxical from within Judaeo-Christian cosmology:

(e) The mortal body is of no transcendental importance, only the soul (spirit).

If a reader perceives Catalina's dilemma through (~PI & QI) and according to traditional Roman Catholic conventions, awareness of the paradox may be tacit, though not totally inert. If a reader views the conflict in light of a critical or skeptical attitude, from (PI & ~QI) or (P & ~Q), the paradoxical underpinnings may be intuited, although perhaps without there existing the possibility of more than a vague articulation of them. The two modes must be alternated, from within (P & Q), in order properly to perceive the paradoxical foundations of the text.

Hence: Diverse readings result from diverse perceptual modes with respect to different CFs entailing particular bodies of culture-world knowledge.

Let us now proceed to the ultimate consequences of Catalina's dilemma.

3.67 *A second phenomenon defining Catalina's paradoxical situation is her inability to meta-communicate.* To communicate *about* communication, to stop a game of chess and discuss the rules of the game, or, in the case of Catalina, to subsume the prescribed and non-prescribed categories into a larger frame or to converse with Artemio *about* their relationship, are examples of movement to higher levels of communication. Therein lies the potential solution to Catalina's problem.

However, unable to conceive of such a higher communicative level she is caught up in a predicament not unlike Bateson's "double bind," a conflict resulting from the confusion of logical types. Lacking the capacity to distinguish between levels of communication, the victim of a double bind may either take a metaphorical statement literally or a literal statement metaphorically and consequently has trouble interpreting his own and other communicative modes. Similarly, at the outset Catalina, incapable of choosing between two supposedly contradictory alternatives, fears that behind every verbal and non-verbal message from Artemio there lies a

concealed meaning which will be detrimental to her. For this reason she has a tendency to continue looking upon him as a man of subterfuge, incapable of sincerity. She is not aware that his attitude toward her has changed and that "the man with her was a new man who looked at her with different eyes, as if wanting her to understand that the time of difficulties had passed now" (Fuentes, 1964, 94). Artemio's messages during their noctural affairs apparently now denote love, but Catalina continues interpreting them as the mere satiation of animal desires. She confuses the level of the messages, assuming that even though his actions denote love they do not denote what would ordinarily be denoted by love.

3.68 *Unable to perceive beyond the immediate alternatives, Catalina apparently cannot transcend closed-structure communication.* To cite one salient case, Catalina believes she "knows" that Artemio took over the *hacienda* and married her by means of deception, but, confined within the conceptual boundaries she has constructed for herself, she either cannot or does not wish to reveal to Artemio that she "knows," . . . or that she "knows" that he "knows not" that she "knows," . . . *ad infinitum.* Such an entanglement wherein the first predication is implied by all succeeding predications constitutes a situation comparable to Laing's psychoanalytical "knots." In fact, it can be rewritten as

(17) (she "knows" (he "knows not" (she "knows" (. . . etc.))))

to approximate Laing's (1971) formulation. Catalina's only escape from this quandary is to reveal her knowledge of Gonzalo's death. When she finally does so at the end of the narrative sequence, Artemio confronts her with the unexpected: he asks forgivness. However, rather than engage in meta-communication Catalina buries herself in a linguistic predicament similar to the first: could he, she replies, forgive her for not forgiving him? Such a line of reasoning would inexorably lead to another verbal helicoid of ever-increasing complexity.

If Catalina cannot meta-communicate, her husband will not since he symbolizes the prototypical *macho* who, as the Mexican poet and essayist Octavio Paz (1961) tells us, must maintain at all costs a reserved hermeticism, who must not reveal his true feelings to others, most of all to a member of the opposite (weaker, in the conception of the *macho*) sex. Denied dialogue at the level of meta-communication, Catalina and Artemio have no hope of coming to terms with their problem.

Knowing that the necessary words will not be spoken, Artemio finally attempts to communicate "love" through messages of relationship rather than through verbal messages. He believes that "he had to make her his without words, and he told himself that his body and tenderness could speak without words. But then he was attached by a new doubt. Would this girl

be able to understand all he wanted to say to her by the act of taking her into his arms? . . . Would she not lose, in the strength of her passion, the possibility of understanding what his passion meant?" (Fuentes, 1964, 95-96). Artemio is tacitly aware of the fact that such abstractions as "love" can be communicated and meta-communicated on verbal levels, but they can also be communicated non-verbally through messages of relationship. However, Catalina, unfortunately caught up in her paradoxical injunction, confirms Artemio's apprehensions, for her interpretation of his non-verbal messages only serves to corroborate further her muddled state of mind.

3.69 The foregoing analysis of Futentes' text leads to the following conclusions:

(a) Reconstruction of the contradictory or paradoxical aspect of the text begins with relations between entities at the surface level of the textual SS-system.

(b) These relations reveal SS-system indices and SS-clusters (i.e., BODY/SOUL, NIGHT/DAY, etc.) which point the way toward the textual "para-reality" where the/a "world model" lies (i.e., Catalina's dogmatic, closed perspective).

(c) At the critical point(s) and from within particular perceptual modes, a distortion arises which is adequately accounted for by viewing, from within the fictional (P & Q) mode, a contradictory set of premises or statements (i.e., Catalina's semantico-existential quandary). Only then is the incompleteness/inconsistency of the text's underlying "world model" perceived.

(d) The textual contradictory or paradoxical base arising out of inconsistent premises/statements may not be consciously perceived. In such cases the surface level of the text is viewed as consistent and self-sufficient.

Numerous other aspects of Fuentes' novel could be accounted for to complement the above analysis. Although limitations of time and space compel me to proceed to an analysis of Borges' short story, there is a significant characteristic of Catalina's dilemma which bears mentioning before closing this section. It has become apparent that, although Fuentes obviously sets up binary distinctions to demonstrate Catalina's internalized problem, the text itself demonstrates the inadequacy of binarism as an all-or-nothing classificatory device. It didn't work for Catalina, so why would it work for us? Simultaneously, Catalina's "logic-existential-pragmatic" dilemma at the epistemological and ideological level is an implicit commentary made explicit concerning the fallacy of atomistic classificatory systems and oversimplified world-views: *knots.*

3.7 Dogmatic Slumber or Dream?: Borges' "The Circular Ruins"

3.70 I will attempt to demonstrate in this section that the underlying reality of Borges' "The Circular Ruins" illustrates how textual metaphorical-metonymical relations are, as implied by PROPOSITION VIII and COROLLARY VII, the product not only of a linguistic mechanism but also of an extralinguistic and cognitive mechanism.

3.71 *A Summary of "The Circular Ruins."* Borges' story occurs in an exotic setting where a magician-priest arrives, exhausted after his long journey from the South, at a circular clearing in the center of which lie the charred ruins of an ancient circular temple. The purpose which guided him "was not impossible, though it was supernatural. He wanted to dream a man: he wanted to dream him with minute integrity and insert him into reality" (Borges, 1964, 46). He first dreamt a circular amphitheater filled with silent, expressionless students, but he soon dismissed them all with the exception of one promising subject. While attempting to teach this young man the nature of the real world, insomnia took over and his project failed entirely. Later he embarked on his second effort: to dream one individual starting with the heart and creating outward to the skeleton and finally to each of the innumerable hairs, "the most difficult task." On receiving instructions from a multiple god whose earthly name was Fire, he gradually accustomed the arduously dreamt boy to reality and sent him downstream to the North "to be born," but only after instilling into him a "complete oblivion of his years of apprenticeship." His son was now, for practical purposes, a part of reality: in fact, "all creatures except Fire itself and the dreamer would believe him to be a man of flesh and blood" (Borges, 1964, 48). One night the magician was awakened by two boatmen who told him of another magician to the North who could walk on fire without being burned. As any good father, the dreamer feared for the emotional well-being of his son, for if he meditated on his rare privelege and discovered that he was a mere image it would be humiliating. However, the meditations of the magician were cut short, for a jungle blaze threatened from the South. The old man, cognizant of the imminence of death, walked boldly into the "concentric" blaze only to realize with "relief, with humiliation, with terror," that the flames could not consume him, "that he too was a mere appearance, dreamt by another" (Borges, 1964, 50).

3.72 *Textual indices.* The task at hand is to reveal, as a consequence of SS-system interaction, the text's underlying "world-model" and its potential transmutation into a more complex meta-model wherein the paradoxical base of the text becomes potentially evident.

The magician "came from the South" and he had dwelled in "one of the infinite villages upstream." On the other hand, after sufficiently preparing his "unreal" son, the magician sent him downstream to the North where "the incessant trees had not managed to choke the ruins of another propitious temple, whose gods were also burned and dead" (Borges, 1964, 47). The conditions of the son's environment are identical to those of the magician. Only the incessant, repetitive trees separate one temple from another. Hence, the spatial trajectories of father and son compose two oppositions, up(stream)/down(South) and down(stream)/up(North), which structurally produce a "cancellation effect." As a result, the action of the story terminates simultaneously everywhere and nowhere; that is, the dreamt image is at the charred ruins of a temple where the magician created his dream image. This sameness of space tends to obliterate the possibility of "simple location." The story alludes not to geographic points but to vague and imprecise notions of circular surfaces.

On contrast to the spatial indices, at the outset it appears that time is linear and accumulates with increasing torpidity. For instance, the magician was able to dream his circular amphitheater filled with youth in a relatively brief lapse of time. This experiment failing after nine or ten days, he was required fourteen more days to perfect the heart of his new subject, one year to create the skeleton, a little less than two additional years to complete his project, and two more long years to prepare his son for "birth." This deceleration of time is analogous to human ontogenetic development, which, rapid in the beginning, later takes on an unbearable sluggishness. When the son (dream image) is ready to become a part of reality the magician places a veil over his eyes in order to remove all recollections of the past so that he would consider himself a "real" man. The son's development, then, is first decelerated and finally halted altogether when he is interpolated into the world of reality. However, this effort to annihilate the past is ultimately futile. Temporal recurrence is foretold by the magician's impression that "all this had happened before," and by the opening scene when the magician enters the charred circle which was "a temple, long ago charred by fire."

The obliteration of "simple location" of space coupled with vague images of spatial circularity implies structurally a denial of linear movement. Concomitantly, the attempt to annihilate the past and establish eternal presentness stems from an implicit attempt to deny temporal irreversibility. Of course these assumptions are dangerous, given the ambiguity of Borges' spatio-temporal indices, and must be properly qualified.

3.73 *The "invincible purpose" which drives the magician can be explicated on two levels: concrete and abstract.* On a concrete level, the magician strives to coordinate his activities perfectly with those of his son.

After the magician sends his son away to be "born," he daily prostrates himself at dawn and at twilight "before the stone figure, imagining perhaps that his unreal child was practicing the same rites, in other circular ruins, downstream; at night, he would not dream, or would dream only as all men do" (Borges, 1964, 49). By means of these ritualistic acts he gradually becomes "as all men" and his absent son is nurtured with the progressive dimunition of his own soul. Then his life's purpose is finally completed, and he persists in a kind of "ecstasy," assuming that his son's immortality is now projected into the physical world, an event which at once symbolically represents the concretion of the unreal (dream) and the eternal coexistence of the real (physical world).

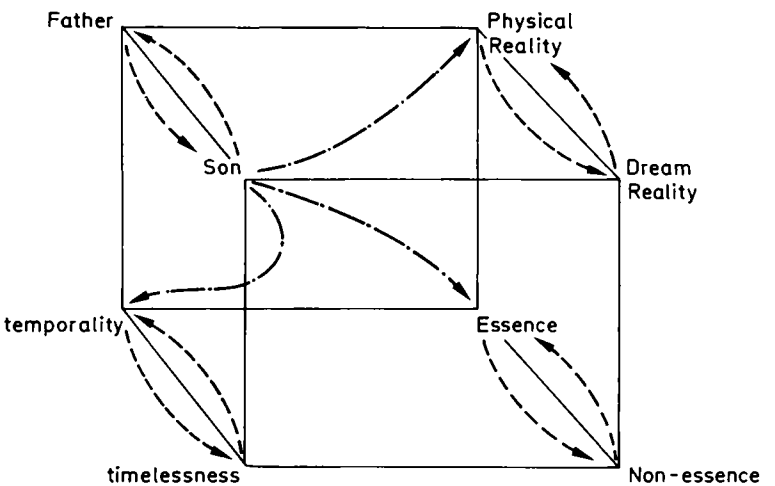
On an abstract level, the coexistence of real father with unreal son coheres with the symbolic coexistence of space and time. Spatial and temporal synchronicity portrayed in Borges' story is a condition quite unlike the linear existence of the physical world. Hence, physical existence, which presupposes human finitude, is opposed to the dream world of spaceless and timeless coexistence. In the material sphere of existence the contradiction between life (not-death) and death (not-life) is presumably irreconcilable. On the other hand, in the nonmaterial order, governed by spatio-temporal synchronicity, this contradiction is nonexistent.

3.74 *The magician's project entails a dogmatic perspective.* Consider the possibility that in "The Circular Ruins" the projection of spatiotemporal synchronicity into linear existence entails a symbolic abolition of the life/death opposition. This assumes an implicit attempt in the story to overcome a temporal existence where spatial hierarchy and temporal linearity predominate. In more concrete terms, the magician's "purpose" stems from a desire to make his unreal son part of tangible reality and vicariously to transcend mortality. For even though all fathers "are interested in the children they have procreated" and "fear for the future" of their children, this interest is at the same time self-interest. Therefore, the constraint at the underlying level of Borges' text which is subject to potential restructuration is mortality, or life/death duality, perhaps the most intransigent of all. It is obviously for this reason that the protagonist is a "magician" and the story is like a "myth."

3.75 *Metaphorical-metonymical interdependency and interaction.* The relations between father and son (reality and dream) in terms of metaphor-metonymy can be illustrated by an abstract schema (see Figure 22). According to this diagram, the desired goal entails actualization of relations of similitude between father-son and reality-dream. By inserting dream image into reality the son could become a "man" and the magician could vicariously transcend the finitude of physical existence. In order to accomplish this

goal, the magician must activate a reconciliation of opposites wherein the son's *timelessness* might predominate over the father's *temporality* and the father's *essence* over the son's *materialessness.* However, the "logical" end must prevail. In actuality the magician becomes an integral part of "dream" existence in simultaneity with the son's supposed entry into "reality," and the "unreal" enjoys synonymity with the "real."

The sequential (metonymical) and the parallel (metaphorical) planes intersect in the narrative where there is potential movement toward more complex levels of organization: a meta-level.



(1) Horizontal and vertical lines are metonymical or sequential relations.
(2) Diagonal lines are (negative) metaphorical or parallel relations.
(3) —·——·——·— is the desired goal.
(4) ———————— is the "logical" end.

Figure 22

According to the reading I have proposed for "The Circular Ruins," this intersection is found at the end, when the magician becomes aware of his beinglessness. He assumes that his monumental task had been completed and "death was coming to crown his old age and absolve him of his labors." But when the metaphorical and metonymical axes converge the paradox underlying his project potentially becomes apparent. His status as the object of yet another dream had obviously become an embedded proposition in his own mind since his own maker had instilled in him, like he did with his own son, a complete oblivion of his apprenticeship.

3.76 *From the very beginning the magician's grand design is doomed to failure.* In the first place, the magician strives (metaphorically) to force the dreamt image into his own supposedly tangible form of existence. This is tantamount to an attempt to concretize the sequential chain of mental events (dream reality) which are the product of unlimited semiotic activity. In other words, the magician tries to establish lines of similarity where ordinarily there would exist only lines of opposition; he tries to make entities like "dream reality" denote something other than what they would ordinarily denote. In order to accomplish this task the magician progressively accustoms his dreamt image into concrete reality by a trial-and-error method. Once he orders his son "to place a banner on a distant peak. The following day the banner flickered from the mountain top. He tried other analogous experiments, each more daring than the last" (Borges, 1964, 49). However, this progressive integration finally leads to the implication that the dream state is (metomymically) an integral part of a greater reality; that is, of a vast dream state in which the magician himself participates. Consequently, the magician becomes aware in the end that entities such as "physical reality" actually denote something other than what he had assumed that they denoted: His "reality" is in reality only a (metaphorical) fiction.

In the second place, the dreamer desires for his dream image that which he simultaneously desires for himself. Realization of this desire is equivalent to the desiring subject's becoming (metonymically) part of the imagined world he has created and (metaphorically) a prisoner of/in his own desires. For son and father to become coequal implies a rupture of the boundaries established between *timelessness* and *temporality, essence* and *non-essence,* "real" and "unreal." The magician's project entails transcendence of what he conceives to be his "physical world" by making that "physical world" correspond to his dream (=thought) world. This project is common to much of Borges' fiction. Wheelock (1969, 46) tells us that for the Argentine writer: "dreaming or thinking is an effort to escape from language, from the idea of the world which language imposes upon us. By 'dreaming' the consciousness hopes to escape its own solidified thought-history, its fixed categories, the dead words that represent memory badly and petrify the world. What the mind finally seeks is a new arrangement of reality." In essence the magician's inability to establish an absolute correspondence between dream (= thought) world and the actual world recapitulates human metaphysical, scientific, and poetic efforts throughout history.

3.77 *Paradox results from a breach of categories.* On a more abstract plane, the magician presupposes at the outset a logical disjunction between the sphere of existence of the dreamer and that of the dreamt, of knower and known. Subject and object (dreamer and dreamt) are considered throughout

the story as members of two classes with distinct boundaries separating them. On the other hand, as was suggested above, the spatial indices in Borges' story manifest an attempt to erase particular geographic location and produce the effect of spatial coexistence. Here and there, or inner and outer, are the linguistic parallels to subject and object, self and world. To obliterate the distinction between dreamer and dreamt, or here and there (the locations of the two circular temples where father and son stand) is to fuse symbolically the spheres of existence of both the "real" and the "unreal." This symbolic fusion cannot become actualized due to the system's built-in paradox. What the magician presumed to accomplish at a *semionic* level backfires at a *symbolic* level: his effort to retaxonomize the world, like that of Catalina in Fuentes' novel, ultimately fails.

To determine the precise nature of this paradox let us go back to the implicit purpose guiding the protagonist's action. At the outset the magician set about to dream a man and "interpolate him into the world of reality." This implies the insertion of something foreign or spurious into the magician's sphere of existence; that is, two distinct entities are presupposed. After his preliminary effort fails, he realizes that his project will be much more arduous than "weaving a rope of sand or coining the faceless wind." This passage reveals two metaphorical images which on a local level represent the impossible conjunction of distinct classes of things: rope (fibered) out of sand (nonfibered) or coin (malleable) out of wind (nonmalleable). Such local level micro-domains as will be discussed in Part 4, are directly related to underlying textual macro-domains.

The magician now attempts to construct one solitary image; a member which simultaneously constitutes its own class. This time it appears that he will realize his goal. However, to integrate the attributes of his son (the object) into the subject's sphere of existence logically implies a simultaneous rupture of definitive boundaries in which process the attributes of the subject are also projected into the object. In other words, two distinct classes, A and B, are governed by different logical orders, and they cannot be integrated while maintaining intact the logical order of either A or B, but both, on becoming members of the same class, must be subjected to a "higher" logical order. Hence, the magician can never integrate his son's sphere of existence into his own sphere without altering what constituted his perception of both spheres.

If, on the other hand, the magician had conceived of his dream world as does primitive man, as merely another facet of the same "reality", his project would nonetheless have been equally futile. For to make "dream" coexist with "reality" would be nonsensical given the fact that in the primitive's animistic conception of "reality," the two entities could not

represent an intransigent dualism in the first place.

Or, Fire might have been construed as a potential mediator between the "reality" of the magician and the "nonreality" of the boy. This appears to be a logical possibility since fire can convert essence to nonessence (matter to energy). Following this "metaphorical" line of reasoning, the magician would be attempting to reverse the process and convert his unreal son (nonessence) to reality (essence). Moreover, only fire would be able to discern the created being's true lack of essence since it cannot consume that which is the final product of its consummatory process: nonessence. Fire appears as an earthly god in one of the magician's dreams and offers magically to give life to his inert dream image. However, in the end it is revealed that the fire deity is helpless against that over which it presumably exercizes dominion: its very sancturary, as in centuries past, is destroyed by fire. This destruction of the earthly sanctuary of the fire deity by fire recapitulates the logical paradox inherent in the magician's project. That is to say, the god of fire is the "symbolic," or "archetypal," expression of fire and as such rests at a distinct logical level. The symbol can be representative of fire but cannot coexist on the same logical level as fire; it cannot be fire itself. When the magician assumes that he possesses the ability to annihilate the boundaries between logical categories, all distinctions between symbol and referent, dreamer and dreamt, subject and object, become non-existent and he loses his capacity, as *Homo symbolicus,* to create an ideal world which rests in total contradistinction to real reference.

3.78 In Part 3 I have defined informally two important properties of all relatively sophisticated and relatively complex texts, and I have attempted to illustrate these properties by means of an informal analysis of two literary texts. Some observations follow from the analyses.

The interaction of SS-system entities in texts can occur at various levels: linguistic, cognitive, and existential, or syntactic, logico-semantic, and pragmatic. The above analysis of Borges' text elucidates primarily the global aspects of parallel-sequential (metaphorical-metonymical) interaction. Local phenomena are primarily either linguistic or they are derived from individual SS-system entities. But these local phenomena are fed into the global domain to produce a coherent whole in the well-formed text.

Interacting SS-system entities cannot be absolutely separated from the paradoxical or contradictory situation inevitably underlying relatively rich and relatively sophisticated texts. The total set of interacting entities composes a complex system. It is *ipso facto* a way of taxonomizing the reality to which the text refers; and the taxonomy, as is the case of all taxonomies, ultimately entails contradiction from one perspective or another. The important point is that just as taxonomies must be in some form

generated, so also they must invariably be subjected to change. I will address this problem when in Part 4 I attempt to formalize the parallel-sequential interactions in texts.

Before closing Part 3, some additional comments are appropriate concerning the relationship between literary texts and nonliterary texts. First, at broad conceptual levels, the "world model" corresponding to the "para-reality" which underlies the literary text is a fictional construct, a possible or impossible world or a set of possible or impossible worlds. On the other hand, there is ordinarily presumed to be potentially a one-to-one correspondence between most "true" nonliterary texts and the "real" world. However, each and every relatively sophisticated and relatively complex nonliterary text contains an underlying "para-reality" which is implicitly or explicitly a fictional construct (i.e., a basic axiom, a set of presuppositions, a model, a "root metaphor," or underlying assumptions, beliefs, etc.). Consequently, the interdependencies and interactions between the SS-system entities in the nonliterary text's fictional construct are ultimately parallel-sequential (metaphorical-metonymical) also.

Second, the contradictory or paradoxical base of the literary text is generated from equivalences between the textual "para-reality" and *real-life human situations.* On the other hand, in scientific and most other nonliterary texts the contradictory or paradoxical base entails inconsistent premises with respect to the *conceptual system* within the text, or between the *conceptual system* and the empirical world. Yet these *conceptual systems* and *real-life situations* cannot be categorically divorced from one another. The *self* is inextricably part of all systems (cf. Part 2). Obviously the linear sequence of statements in nonliterary texts is with less frequency than in the case of literary texts, connected to the underlying "para-reality." Moreover, with increasing embedment of CFs in nonliterary texts constructed/perceived within a given relatively homologous community, these lines of connection tend to become more and more implicit. Moreover, generation of the linear sequence of interconnected statements in most nonliterary texts must follow relatively rigid conventions with respect to content, organization, and style. Hence contradictions are often derived from illogically interconnected statements rather than at the level of the "secondary modelling system." Sequential interconnections in the literary text, on the other hand, are subject to fewer well-defined conventions. Consequently, category mistakes, contradictions, and paradoxes at the surface level of literary texts are ordinarily considered to be no cause for alarm since, the product of artistic imagination, they do not correspond directly to the "real" world. Yet many times they are symtomatic of deeply embedded anomalies at the core of the culture-bound, language-bound, and

Weltanschauung-bound world as it is conceived/perceived.

The above assertions are unavoidably sweeping. This is necessary since they must refer to broad perceptual modes by means of which all texts are read. In light of the approach adopted in Part 3 of this study it is possible to avoid such equally sweeping statements from a more limited perspective such as: "Science is more metonymical than metaphorical and literature is more metaphorical than metonymical" (for example, Lévi-Strauss, 1966). Or: "Realist prose is more metonymical than metaphorical and Romantic prose is more metaphorical than metonymical" (for example, Jakobson, 1956). The truth of the matter is that what is metonymical and what is metaphorical can many times depend upon the mode through which it is perceived. What is one person's metaphor can be another person's metonym.

Notes

1. The notion of paradox at the base of human conceptual systems has been postulated for myth (Lévi-Strauss, 1963), metaphor (Wheelwright, 1968), riddles (Maranda, 1971), folktales (Maranda & Maranda, 1971), primitive and modern religion, ritual, and taboo (Leach, 1976), logical, mathematical and scientific systems (Godel, 1962; Kuhn, 1970) metaphysical and cosmological systems (the long tradition from Pascal, Kierkegaard, and Nietzsche to Unamuno and Tillich), art (Slaatte, 1968; Goldmann, 1969, 1976; Brooks, 1947; Gombrich, 1960), and jokes and the creative process (Koestler, 1964; Watzlawick, Beavin, & Jackson, 1967; Freud, 1963; Fry, 1963). Paradox is also endemic in all forms of human communication (Bateson, 1972; Ruesch & Bateson, 1951; Watzlawick, Beavin, & Jackson, 1967; Watzlawick, 1977). And of course paradoxes have aggravated the mathematicians and logicians for centuries.
2. See from the scientific perspective, Popper, 1963, 1972; from the aesthetic, Beardsley, 1958 and Gombrich, 1960; from every-day life, Bruner, 1957, 1962.
3. This is little more than a linguistic version of Locke's theory of association of ideas which hearkens back to Aristotle. The idea is also analogous to Frazer's (1959) theory of magic by similarity (metaphor) and magic by contagion (metonymy). It appears that Jakobson took his cue directly from Freud. Structuralist and linguistic formulations similar to that of Jakobson have recently been employed – albeit with controversial results – by, among others, Lacan (1966) in psychoanalysis, Lévi-Strauss (1966) in anthropology, Pierre and Elli Köngäs Maranda (1971) in folklore, Genette (1970) and Lodge (1977) in literature, Barthes (1970) in his theory of semiology, and LeGuern (1973), Henry (1971) and the *Groupe* μ (Dubois, et. al., 1970) in semantics.
4. These SS-system restructurations, brought about by the postulated cognitive mechanism, are compatible with hypotheses of radical change put forth in a number of disciplines: scientific (Kuhn, 1970, and the *Weltanschauung* theorists) aesthetic (Mukarovsky, 1970; Shklovsky, 1965), intellectual-epistemological (Goldmann, 1969; Althusser, 1970; Foucault, 1971), psychological (Piaget, 1971), biological (Dobzhansky, 1962; Waddington, 1957), linguistic (Shaumyan, 1977), or mathematical (Thom, 1975b).

5. I must emphasize that the "existential paradoxes" into which some of the characters in Fuentes' novel are caught up involve, properly speaking, a pragmatics of human communication in general. A comparable situation could easily arise in a real-life situation. The following analysis, then, is not stylistic or aesthetic. That is, language, *per se*, is not the focus, but how the language of the text effects the characters' view of their world within the contextual frame established by the text. This focus is extralinguistic and conceptual rather than linguistic and aesthetic. It entails world-building with fictions created from old or new SS-system entities.

PART 4

Toward a Formal Model of Texts

The work of art or of science is universal because each of us re-creates it. We are moved by the poem, we follow the theorem because in them we discover again and seize the likeness which their creator first seized. The act of appreciation re-enacts the act of creation, and we are (each of us) actors, we are interpreters of it.

Bronowski (1956, 27)

4.1 Preliminaries

4.11 *In general, SS-systems and their accompanying texts are similar to paradoxes in logical and mathematical systems.* Like paradoxes, we do not know exactly when, where, or how novel SS-system entities will appear, or what their precise nature will be. We can only hope successfully to interpret and resolve them when they are before us (Quine, 1962). In this sense, paradoxes, like SS-systems, can only be studied one at a time, as they appear. Moreover, since SS-systems are impredictable, a typology of universal structures for all SS-systems is understandably still beyond grasp. Ultimately, verifiability or falsifiability has no place here either. "Truth" in one system may be "falsity" in another. Consequently, a given system is the context within which the meaning of *semions* and/or *symbols* must be defined. The intricate web in which they are found must be analyzed thoroughly, but with an explicit perspective in mind, before generalizing statements on that particular system can be forthcoming (for similar commentary on logical systems, see Black, 1975, 83-84; and Fraenkel, Bar-Hillel, Levy, 1973, 11). Hence one SS-system can be compared and contrasted with another, but only after they have been analyzed methodically. In this sense SS-systems are also like paradoxes.

4.12 *What, in the final analysis, can be formalized with respect to SS-systems?* Not our knowledge concerning *the* structure or content of

each and every SS-system, but our knowledge of *how* to construct and comprehend a finite system from a quasi-infinite set of possible *semionic* and *symbolic* entities in an SS-system. That is, what can be formalized is a *congitive mechanism by means of which we select, construct, and perceive SS-systems.* Thus, a model of SS-system generation and perception must be capable of:

(a) Specifying a possible generating mechanism.
(b) Specifying the functions of the structures allowing the generating mechanism "freely to create" SS-systems and changes in SS-systems.
(c) Specifying the functions that provide capability of generating increasing complexity and variability at meta-levels of SS-system discourse.

With respect to condition (a), the SS-system consists of a set of structural possibilities and assigns a structural description to the text. The mechanism does not determine the place and the nature of variations, transformations, and changes, but only *sets the framework for variability.* Concerning condition (b), "free creation" of *semions* and *symbols* implies a hierarchical structure of the text. Generativity at the linguistic level, potentially infinite with respect to language and text, constructs a "world model" underlying the text which is in part compatible with but subverts in one form or another and to a greater or lesser degree all previous fictitious and/or "real" world models. Condition (b) relates to condition (c) in so far as the generation of varying degrees of novelty tends to complexify conventional modes of SS-system generation while introducing variations. From within a given CF, text production increases the level of organizational complexity until a new perspective of the textual SS-system is initiated; that is, until an SS-system "swith" is enacted, and the process recommences from ordered simplicity to organizational complexity. Hence, following from the propositions in Part 3:

DEFINITION 4–I: An SS-system within a text is a set of local level images, each finite in extension and constructed by relations of parallelism (metaphor) and sequentiality (metonymy) out of a finite group of *semionic* and/or *symbolic* entities.

Specification of the construction/perception of SS-systems, then, follows specification of the local mechanism governing the construction/perception of individual parallel-sequential relations. This local mechanism is dependent upon the rules, as put forth in DEFINITION 1-II, for transforming lexical entities into SS-system entities (see Appendix II for further discussion of this local mechanism specifically with respect to metaphor and metonymy). In this light, the present task is to describe what will be called MODEL A –

a model for the construction/perception of the surface-level network of SS-entities – and MODEL B – a model of SS-system change.

4.2 The SS-System: MODEL A

4.21 *Preliminary propositions and definitions.*

PROPOSITION IX: The network parallel-sequential relations constructed/perceived in SS-systems consists of a matrix of interdependent and interacting entities.

This follows especially from PROPOSITION VIII, COROLLARY VII, and DEFINITIONS 3-I-III in so far as a matrix can adequately represent the parallel-sequential relations as a fabric of interdependent and interacting lines of connection in an SS-system.

DEFINITION 4-II: The language of a given text system (hereafter TS) is appropriated from a set of *semions* and/or *symbols*, which make up the SS-system (hereafter SSS), for the purpose of conveying/understanding certain ideas, concepts, inferences, opinions, intuitions, desires, emotions, etc.
DEFINITION 4-III: The surface manifestation of an SSS consists of a finite set of *semionic* and *symbolic* entities defined as a set of structural representations and ordered by means of relations of parallelism and sequentiality: *a closed matrix* (compare to Hesse, 1969/60, and Buchanan, 1932, on scientific models and metaphors).

In this sense the surface parallel-sequential matrix consists of rows and columns of entities. The first row in the matrix constitutes the "paradigm" row and the first column is the "paradigm" column. A part of a matrix is also a matrix; it is a subset of the entire set of entities connected by parallel-sequential relations.

DEFINITION 4-IV: Permuting the order of the entities in a matrix is a "rhetorical" operation.

For example, consider the following sentences:
(1) Rommel was a fox.
(2) Rommel was a general.
(3) That Porsche is a bomb.

(4) That Porsche is a hot set of wheels.

(1) and (3) contain a parallel, or metaphorical, entity. In each case a *figurative* lexical item exists where a *literal* item might have existed: "bomb" for "fast car" and "fox" perhaps for "cunning man." (2) and (4), on the other hand, are sequential. But in this case (2) is composed exclusively of *literal* sequential relations while (4), in contrast, is composed of *figurative* (i.e., metonymical) relations. (2) could be paraphrased in a tautological sense as "That general is a general," for Rommel (individual) belongs to a class (of generals). The part is a subset of the class of things. (4), on the contrary, represents first a substitution of "hot wheels" for "fast car" in the paraphrase: "That Porsche is a fast car." Then a second paraphrase, "That fast car is a fast car," provides a tautology similar to the one above. Hence statements along the horizontal axis may be either literal or a composite of literal *and* figurative representations, while statements along the vertical axis must be exclusively figurative. This accounts for the special – and in many cases implicit – nature of the underlying "para-realistic" level of the text. As might be surmised from above arguments, a relatively sophisticated and relatively complex matrix can take on an almost unlimited number of possible forms through permutations and recombinations.

At this point I will now introduce a subdefinition which will admittedly appear strange, but keep in mind that the terms are not to be used in the orthodox sense. Consider all parallel relations to be *metaphorical.* And, consider all literal as well as figurative sequential relations to be *metonymical.* That is to say, metonymical relations will be classed as *figurative* and *nonfigurative.* Nonfigurative metonymy entails contiguity between ordinarily literally interpreted lexical items and SS-system entities along the linear syntagmatic chain. For example, "Napoleon is ruthless" might by itself be considered a literal and non-SS statement. However, if both "Napoleon" and "ruthless" are related to figurative SSS entities at other points in a relatively complex SSS, then they must be considered sequential (metonymical) although ordinarily nonfigurative lexical items, for they are at least indirectly related to those SSS entities. In such case, the necessary relationship between "Napoleon" and "ruthless" is not adequately describable merely by means of grammar rules or ordinary semantic categories. Viewed from within the entire SSS, "ruthless" becomes an element (or attribute) which states what is from a particular perspective a necessary condition of "Napoleon." This necessary condition is adequately describable only through its interaction with other *semionic* and/or *symbolic* statements in the entire SSS (i.e., "Napoleon is a tyrant," "Napoleon is a wolf," "Napoleon is hungry," "Napolen hunts down and kills the peasants," etc.)[1]

Let us now proceed toward a specification of the SSS matrix.

4.22 *The possible forms represented by a matrix consist of a set of "paths" between the SSS-entities in that matrix.*

DEFINITION 4-V: Sequential metonymical entities (hereafter Mn) are connected by metonymical relations (hereafter RMn) and parallel metaphorical entities (hereafter Mf) are connected by metaphorical relations (hereafter (RMf).

However, RMn-RMf are not wholly arbitrary; they must satisfy certain requirements which are given in the following definitions.

DEFINITION 4-VI: Constituting complementary "mappings," RMn and RMf are mutually exclusive.

That is to say, no pair of entities can be both metaphorically and metonymically related from within the same perspectival field at the same point in time, although a change of perspective through time can change the relations. Hence the sum of RMn and RMf constructed/perceived in a given TS combine to produce the SSS matrix for a given writer/reader. However, each writer/reader is finite. Unable simultaneously to be aware of all RMn and RMf in a relatively complex text, his/her holistic construction/perception of the TS implies a selection of a given portion of the RMn and RMf. With respect exclusively to the reader, different readings by different readers entail slightly to radically variant selections, and therefore variant SSS matrices, What is a particular case is an RMf for one reader might conceivably be an RMn for another. In this light, matrices, like any and all taxonomies, are theoretically and potentially susceptible to an indefinite number of alterations. Hence:

DEFINITION 4-VII: A given SSS consists of an interdependent set of Mn-Mf entities which are potentially interrelated by means of the symbol "$\Longrightarrow$" (which denotes, "is replaced [or is replaceable] by").

In this sense one entity is potentially "transformed" into or "mapped" onto/into another entity, and new meaning is potentially derived from the system. Hence, with respect to a given matrix, all RMn and RMf between all the MN-MF entities constitute a set of possible "paths" leading to new entities.

For example, consider the following matrix consisting of the entities (A, B, C, D, E, F, G, H): (next page)

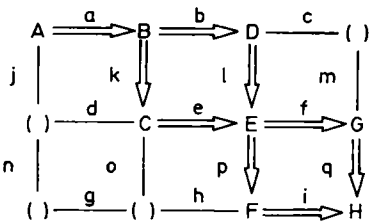


Figure 23

"Paths" (l, b) are equal to (e, k). That is: lb, ek: B ⟹ E. A in this matrix is called the minimal entity and H the maximal entity. In other words, A is the first entity and is dominated (followed) by all others while H dominates (follows) all other entities. Therefore, summativity of operations holds true. The total number of "paths" from an initial state to a final operation is:

$$\left(\Sigma X_{A \Longrightarrow H}\right)_{E}$$

where all "paths" must go through E.

It can be further observed from Figure 23, that the "paths" represented by RMn-RMf in a TS will proceed from usually one, but sometimes more than one, minimal entity (image) to the maximal entity or to one of two alternative maximal entities. Consequently, every finite set (matrix) has at least one, but sometimes more than one, minimal entity, and one, but usually two or more alternative maximal entities. Hence multiple readings of a TS are possible. It follows from this that an idealized inifinite set (matrix) represented by the potential which is manifested in the human cognitive capacity for constructing/perceiving over time an unlimited number of TSs of indefinite length need not possess minimal nor maximal entities. This idealized matrix would represent what has been termed "unlimited semiosis." It would necessarily remain an ideal, never to be actualized.

In sum, a matrix assigns to each possible pair of *semionic* or *symbolic* entities an RMn or an RMf equivalent. The holistic ("macromolecular") domain of a TS consists of the combination of all possible RMn-RMf.

4.23 *SSSs are constructed/perceived by means of a "matrix grammar."* The present task is to account for the generation of a sequence of SSS strings within a TS. An SSS string is not equivalent to a sentence string. Generation of a sentence string must follow predetermined and relatively restrictive grammar rules, while the SSS string is encumbered by few restrictions:

SSSs are relatively "freeely created." Due to the absence of grammar restrictions, the matrix of entities connected by RMn and RMf is a finite set of sequences generated semi-linearly. The sequences cannot be separated as can sentence strings in a TS since in the matrix there is no punctuation. One sequence is "rewritten" into the matrix, then the next, and so on until the entire TS is represented.

The chief problem concerning a formal theory with which to describe the SSS matrix is that of developing a finite representation capable of describing potentially an infinite SSS. This problem can only be resolved by setting down an explicit set of rules, albeit relatively free of restrictions in this case. The model proposed will be a variation of a "matrix grammar" (see Salomaa, 1972).

DEFINITION 4-VIII: A matrix generator is called an "ordered quadruple," denoted by $G = (S_n, S_t, T, M)$.

S_n is an *artificial vocabulary of non-terminal variables* (SSS, Mn, Mf). S_t is the *terminal set of semions and symbols* in the TS; that is, the sum of actual *semions* and *symbols*, which in this case are Mn and Mf entities denoted by $\underline{a}$ and $\underline{b}$ respectively. T is the *initial SSS-entity* in the TS, and M is a *finite set of sequences* whose entities are ordered pairs. The finite set of ordered pairs of SSS-entities consists of a set of "rewrite rules" denoted by P → Q, which means that the *semionic-symbolic* entity P is replaced by or "transformed into" the *semionic-symbolic* entity Q. These rewrite rules govern the set of possible "paths" to be followed in an SSS matrix. A possible matrix generator for an SSS is: $G = (\{SSS, Mn, Mf\}, \{\underline{a}, \underline{b}\}, SSS, M)$, where $\{\underline{a}, \underline{b}\}$ are represented by the actual Mn and Mf entities in the SSS matrix, and M consists of the following rewrite rules:[2]

$$[SSS \rightarrow Mn] \qquad \begin{bmatrix} Mn \rightarrow \underline{a}Mn \\ Mn \rightarrow \underline{a}Mf \\ Mn \rightarrow \underline{a} \end{bmatrix} \qquad \begin{bmatrix} Mf \rightarrow \underline{b}Mf \\ Mf \rightarrow \underline{b}Mn \\ Mf \rightarrow \underline{b} \end{bmatrix}$$

For example, using this set of rules the following SSS sequence can be derived:

SSS → Mn (That is, the initial entity in the Text is the Text is metonymical)

→ $\underline{a}_1$MF (The initial metonymical entity, $\underline{a}_1$, is followed by a metaphorical entity by the rule: Mn → $\underline{a}$Mf.)

→ $\underline{a}_1\underline{b}_1$Mn (The metaphorical entity is followed by a metonymical entity by the rule: Mf → $\underline{b}$mf.)

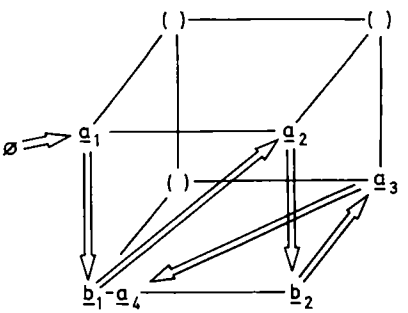
→ $\underline{a}_1\underline{b}_1\underline{a}_2$Mf (By rule: Mn → $\underline{a}$Mf.)

→ $\underline{a}_1\underline{b}_1\underline{a}_2\underline{b}_2$Mn (By rule: Mf → $\underline{b}$Mn.)

→ $\underline{a}_1\underline{b}_1\underline{a}_2\underline{b}_2\underline{a}_3$Mn (By rule: Mn → $\underline{a}$Mn.)

→ $\underline{a}_1\underline{b}_1\underline{a}_2\underline{b}_2\underline{a}_3\underline{a}_4$ (By rule: Mn → $\underline{a}$, where the metonymical entity, $\underline{a}_4$, is in this case the terminal entity.)

This hypothetical SSS can be geometrically represented by the following matrix which is constructed in three dimensions for convenience:



(Where ø is the null set prior to generation or perception of the matrix.

Figure 24

All vertical "paths" in Figure 24 represent RMf, while all horizontal and diagonal "paths" represent right-linearly generated/perceived entities by means of literal or figurative RMn. The empty slots in parentheses represent elements pertaining to the implicit level of the cognitive aspects of the TS. They are part of the total structure although not explicit; hence they are not part of the empty or null set.

Notice also that a hypothetical "path" constructed from $\underline{a}_1$ to $\underline{b}_2$, or from $\underline{b}_1$ to $\underline{a}_2$, is a composite of Mn and Mf replacements. It entails Mn replacement coupled with use of a literal term in place of an Mf entity, or conversely, an Mf entity in place of a literal term. $\underline{a}_3$ to $\underline{a}_4$, on other hand, is a composite of two Mn replacements.

4.24 *Additional rules.*

The matrix in Figure 24 could pertain to the following relatively simple TS:

(5) The *peasants* ($\underline{a}_1$) are sheep ($\underline{b}_7$) and *Napoleon* ($\underline{a}_2$) is the *wolf* ($\underline{b}_2$) who *slaughters* ($\underline{a}_3$) *them* ($\underline{a}_4$).

However, a close observation of this matrix reveals that further rules are required. A statement following the path from $\underline{a}_1$ to $\underline{b}_2$ in Figure 24 such as, "The peasants confronted the wolf," makes explicit only two of the entities appearing in statement (5). Other entities exist in relation to that explicit pair of entities (i.e., $\underline{b}_1$ and $\underline{a}_2$) which presumably are also part of the general system. They are implicit rather than explicit. Yet, with respect to the range of statements that can be potentially generated from the system, they must be considered part of a complementary set of entities presupposed by the explicit entities. Hence, with respect to a hypothetical path from $\underline{a}_1$ to $\underline{b}_2$, the relation is necessarily Mn since progress is from the subject of the statement to its contiguous object along the syntagmatic chain. Yet this relation entails what I will call *metonymical lowering*. Metaphorization is always present in *metonymical lowering* since the existence of entity $\underline{b}_2$ necessarily implies the existence of its complement, $\underline{a}_2$. In contrast, the "path" from $\underline{b}_1$ to $\underline{a}_2$ entails *metonymical raising* since the statement begins at the figurative Mf level and is raised to the nonfigurative level after inclusion of the following contiguous Mn entity. The "path" from $\underline{a}_3$ to $\underline{a}_4$, on the other hand, presents no such problem, for no metaphorization or demetaphorization is involved.

Metonymical raising and *lowering* not only entail some representation of implicit or embedded entities but also some representation of possible alternative paths. For example, consider the following graphic schema depicting *metonymical lowering:*

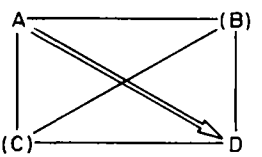


Figure 25

"Path" A $\Longrightarrow$ D and the implied entities (B) and (C) also imply possible alternative "paths": A $\Longrightarrow$ (B) $\Longrightarrow$ D, A $\Longrightarrow$ (C) $\Longrightarrow$ D, A $\Longrightarrow$ (C) $\Longrightarrow$ (B) $\Longrightarrow$ D, etc. Since both (B) and (C) have been deleted in the Mn-Mf transition from A to D they may be represented as implicit or empty entities, (λ's), in the statement A $\Longrightarrow$ D. These same entities would be non-empty in complementary statements such as, say, A $\Longrightarrow$ B $\Longrightarrow$ C $\Longrightarrow$ D, or A $\Longrightarrow$ C $\Longrightarrow$ B $\Longrightarrow$ D. In the case of *metonymical raising,* the "path" in Figure 25 might be C $\Longrightarrow$ B, and (A) and (D) would be the implicit entities.

In this sense, then, *metonymical lowering* can be denoted by the superscript, 1, and *metonymical raising* by the superscript, -1 (since it involves "inverse" metaphorization), and the existence of alternative "paths" by, λ (the empty entity).

Another problem remains. Metonymy can occur in two forms: literal and figurative (although, as pointed out above, literal forms of metonymy must be directly related to figurative metonyms or metaphors in order to consititute part of the total semiotic system). Therefore, since a figurative Mn entity is used in place of a literal Mn entity in the TS, the figurative entity need only be primed (Mn ') to make the distinction clear.

For example, consider the following system:

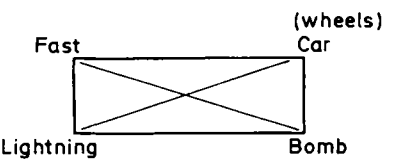


Figure 26

and these statements:

(6) That's a fast car.
(7) That's a fast set of wheels.
(8) That's a fast bomb.
(9) Those are lightning wheels.

We will assume that (6) is literal and hence a *nonsemionic* or *nonsymbolic* statement while (7) is a paraphrase of (6) where a figurative metonym has replaced the literal contiguous metonym. (9) uses metaphor with raised figurative metonymy, and (8) involves a literal metonym as the initial element which is connected by lowering to an Mf element. Thus, all possible statements within the closed system constructed/perceived from a given

perspective can be accounted for by an additional set of rules for raising and *lowering* RMn "paths":

$$\begin{bmatrix} Mn \rightarrow Mn' \rightarrow \underline{a}' \\ \rightarrow Mf^1 \rightarrow \underline{b}^1 \\ \rightarrow \lambda Mf^1 \rightarrow \lambda \underline{b}^1 \\ \rightarrow Mn^{-1} \rightarrow \underline{a}^{-1} \\ \rightarrow \lambda Mn^{-1} \rightarrow \lambda \underline{a}^{-1} \end{bmatrix}$$

(Where, λ, represents implicit [empty] entities, superscript 1 applies to *lowered* metonymization, and superscript -1 applies to *raised* metonymization.)

According to these rules the SSS statements (7) and (8) can be rewritten as:

(7) SSS → Mn
→ $\underline{a}_1 Mn'$ (by rules: Mn → $\underline{a}$Mn, and Mn → Mn')
→ $\underline{a}_1 \underline{a}'_2$ (by rule: Mn' → $\underline{a}'$)

(8) SSS → Mn
→ $\underline{a}_1 \lambda Mf^1$ (by rules: Mn → $\underline{a}$Mn, and Mn → λMf^1)
→ $\underline{a}_1 \lambda b^1_1$ (by rule: λMf^1 → $\lambda \underline{b}^1$)

However, statement (9) begins with an Mf rather than an Mn entity. The embedded (implicit) level of the literal element of which the Mf entity is a figurative representation must be properly accounted for. Therefore, since the TS can begin with an Mf entity which is the transform of an embedded literal or figurative Mn entity, the following rules apply:

$$\begin{bmatrix} Mn \rightarrow \lambda Mf \rightarrow \lambda \underline{b} \\ Mn' \rightarrow \lambda Mf \rightarrow \lambda \underline{b} \end{bmatrix}$$

(9) is therefore rewritten as:

SSS → Mn
→ λMf (By rule: Mn → λMf.)
→ $\lambda \underline{b}_1 Mn$ (By rules: λMf → λ$\underline{b}$, and Mf → $\underline{b}$Mn.)
→ $\lambda \underline{b}_1 Mn'$ (By rule: Mn → Mn'.)
→ $\lambda \underline{b}_1 Mn'^{-1}$ (by rule: Mn → Mn^{-1}.)
→ $\lambda \underline{b}_1 a_1'^{-1}$ (By rule: Mn^{-1} → $\underline{a}^{-1}$.)

With these additional rules a "condensed" version of statement (5) could read:

(10) The *wolf slaughters* the *sheep.*
and it could be rewritten as:

SSS	→ Mn	
	→ λMf	(By rule: Mn → λMf)
	→ $\lambda \underline{b}_1$Mn	(By rules: λMf → λb and Mf → bMn)
	→ $\lambda \underline{b}_1 \underline{a}_1$Mn	(By rule: Mn → aMn)
	→ $\lambda \underline{b}_1 \underline{a}_1 \underline{a}_2$	(By rule: Mn → a)

In this case, for instance, "Napoleon" and "peasants" would represent implied or "empty" entities in the matrix such that to comprehend the statement in its proper context would require simultaneous awareness of those implied entities. Otherwise the statement might be construed as literal and therefore a purely linguistic statement rather than an SSS statement constructed/perceived at the "secondary level" by means of the linguistic medium.

To recap, it can be observed that: (a) a large number of SSS statements are possible from within a relatively simple matrix, (b) the matrix contains only figurative (*semionic* and *symbolic*) entities and other entities immediately dependent upon and in interaction with those figurative entities, (c) given the established set of entities in an SSS matrix there are few restrictions concerning the "paths" followed in generating *semionic* and *symbolic* statements; restrictions are established only by the rules for metaphorization and metonymization, and (d) some texts (scientific) will contain relatively few *semionic* and *symbolic* entities while others (literary) will contain many, and in some texts the entities will be concealed while in others they will be relatively explicit.

4.25 *Two examples.*

EXAMPLE 1. The following verse is from "Poet Grown Old" by the Chilean poet Pablo Neruda:

(11) He gave me his hand
like an old tree
that lengthens the fork
of its branches,
leafless
and fruitless (Neruda, 1961, 265)

First, a hypothetical matrix is constructed:

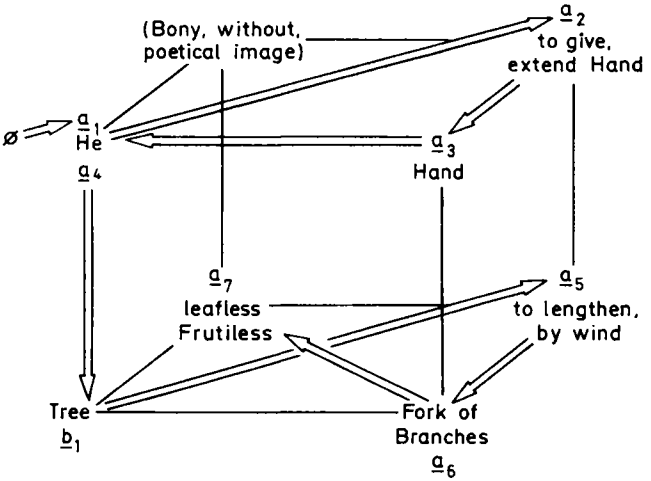


Figure 27

To translate this poetic statement into SSS-statements represented in the matrix it is necessary properly to qualify the subject of each statement. "He gave me his hand" is appropriate without being rephrased, but "like an old tree" refers back to "He" and must be rephrased as, "He is like an old tree" in order appropriately to be metaphorized. Subsequently the remainder of the statements remain metaphorized at the lower level and need no further qualification.

By use of the matrix generator rules proposed above, the following SSS is derived:

SSS → Mn
→ $\underline{a}_1$Mn
→ $\underline{a}_1\underline{a}_2$Mn
→ $\underline{a}_1\underline{a}_2\underline{a}_3$Mf
→ $\underline{a}_1\underline{a}_2\underline{a}_3\underline{a}_4$Mf
→ $\underline{a}_1\underline{a}_2\underline{a}_3\underline{a}_4\underline{b}_1$Mn
→ $\underline{a}_1\underline{a}_2\underline{a}_3\underline{a}_4\underline{b}_1\underline{a}_5$Mn
→ $\underline{a}_1\underline{a}_2\underline{a}_3\underline{a}_4\underline{b}_1\underline{a}_6\underline{a}_6$Mn
→ $\underline{a}_1\underline{a}_2\underline{a}_3\underline{a}_4\underline{b}_1\underline{a}_5\underline{a}_6\underline{a}_7$

The proper Mn-Mf representation of this SSS in the terminal vocabulary is:

(12) He $\overset{\text{RMn}}{\Longrightarrow}$ Grave $\overset{\text{RMN}}{\Longrightarrow}$ Hand $\overset{\text{RMn}}{\Longrightarrow}$ He $\overset{\text{RMf}}{\Longrightarrow}$ Tree $\overset{\text{RMn}}{\Longrightarrow}$

Lengthen $\overset{\text{RMn}}{\Longrightarrow}$ Fork of branches $\overset{\text{RMn}}{\Longrightarrow}$ Leafless and fruitless

(It must be kept in mind that the matrix generator is responsible solely for the surface generation of the SSS.)

EXAMPLE 2. Descartes in his *Discourse on Method* states that:

(13) I have described the earth and the whole visible universe *as if it were* a machine, having regard only to the shape and movement of its parts (in Turbayne, 1962, 39).

By the same method employed for Neruda's artistic text, a hypothetical matrix is constructed. In this case the subject of the figurative aspect of the statement must also be qualified. "Visible" and "shape and movement of its parts" refers to the universe (and the earth) as well as to Descartes' metaphor-model: *the machine.* Consequently a set of "atomic" premises and a conclusion can be abstracted from Descartes' statements which are: (a) the shape of a machine is visible, (b) the movement of the parts of a machine is visible, (c) the shape of a machine is describable, (d) the movement of the parts of a machine is describable, (e) only part of the universe (including the earth) is visible, (f) the shape of the universe (including the earth) is indescribable, (g) the movement of the parts of the universe (including the earth) is indescribable, (h) the shape of the universe (including the earth) is describable in so far as it is like a machine, (i) the movement of the parts of the universe (including the earth) is describable in so far as it is like a machine.

From this rather exhaustive list the hypothetical matrix can be constructed commensurate with (13) (next page).

The SSS for this statement is:

$$
\begin{aligned}
\text{SSS} &\rightarrow \text{Mn} \\
&\rightarrow \lambda\,\text{Mf} \\
&\rightarrow \lambda\,\underline{b}_1\,\text{Mn}^{-1} \\
&\rightarrow \lambda\,\underline{b}_1\underline{a}_1{}^{-1}\,\text{Mn} \\
&\rightarrow \lambda\,\underline{b}_1\underline{a}_1{}^{-1}\underline{a}_2\,\text{Mf} \\
&\rightarrow \lambda\,\underline{b}_1\underline{a}_1{}^{-1}\underline{a}_2\underline{b}_2\,\text{Mn} \\
&\rightarrow \lambda\,\underline{b}_1\underline{a}_1{}^{-1}\underline{a}_2\underline{b}_2\underline{a}_3\,\text{Mn} \\
&\rightarrow \lambda\,\underline{b}_1\underline{a}_1{}^{-1}\underline{a}_2\underline{b}_2\underline{a}_3\underline{a}_4
\end{aligned}
$$

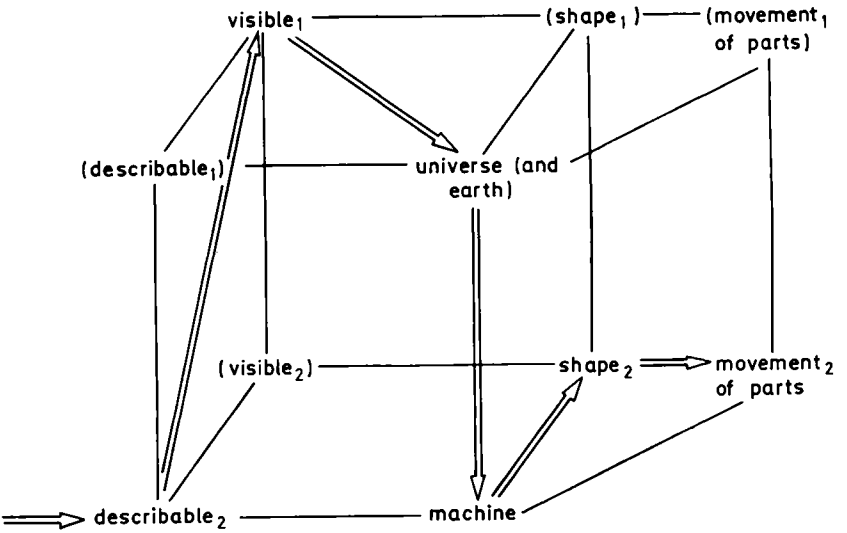


Figure 28

And the Mn-Mf representations in the terminal vocabulary would be:

(14) Described $\overset{RMn}{\Longrightarrow}$ Visible $\overset{RMn}{\Longrightarrow}$ Universe (and earth) $\overset{RMf}{\Longrightarrow}$ Machine $\overset{RMn}{\Longrightarrow}$ Shape $\overset{RMn}{\Longrightarrow}$ Movement of parts.

In light of the above examples, a number of remarks follow:

(a) Only those lexicon which constitute part of the total SSS are included in the SSS generation/perception. This must be the case for the SSS matrix pertains exclusively to the "secondary level" of transformed lexical items.

(b) Those entities in parentheses from Figures 27 and 28 are implicit. They represent corresponding entities from the range of possibilities from which the writer chooses a finite set of entities with which to construct his/her TS.

(c) From within a given matrix the writer has before him/her a large number of possible Mn-Mf combinations ("paths"). Once these combinations ("paths") are set down in the TS the reader is allowed a large range of possible reconstructions of the Mn-Mf entities, both explicit and implicit.

(d) Reconstruction of a hypothetical matrix by the reader is an analysis-by-synthesis activity governed by culturally shared experiences and commonplace associations as well as by personal idiosyncracies. Hence such reconstruction is at least partly arbitrary.

And, from MODEL A described above, further remarks are forthcoming with respect to the matrix generator:

(e) In constructing MODEL A it is not imperative that all possible interpretations (reconstructions) of a concrete TS be demonstrated, or that only the correct interpretation (reconstruction) be posited. The objective is to show *how* any and all SSSs and TSs are theoretically constructed and reconstructed – a formal model.

(f) In a given matrix, once the strings of productions are begun they are applied continuously up to the end of the TS: there is no "punctuation."

(g) Grammar rules and transformational grammar are not directly relevant to the matrix system. For instance, the transformation from the active to the passive tense is simply represented by an inverse "path" in the matrix. "That man is smoking a cigar," is represented by, "Man ⟹ Smoking ⟹ Cigar," while "A cigar is being smoked by that man" is represented by, "Cigar ⟹ Being Smoked ⟹ Man."

(h) Syntactic markers can be either Mf or Mn entities. "That is a *sweet* sound," "That man is a *lion*," and "He *plowed* through his homework," are metaphorical. "*Golden* boy is handsome," "*Capitol Hill* has spoken," and "He's *tipping* the bottle" are figurative and metonymical. In addition to adjectives, nouns, and verbs, pronouns and other syntactic markers can also be alternately either Mf or Mn.

(i) The set of rules for matrix generation is adequate for all possible matrices. The number of rules used in the generation of a single TS, especially if if it is relatively uncomplicated, may be a subset of that set of rules.

4.26 It is important to note, in addition, that *statements can also be disambiguated by means of proper reconstruction of the SSS-entities.* All complex TSs are to a greater or lesser degree ambiguous since there are in the surface matrix many alternative "paths" when the implicit SSS-entities are included in the total system. Assume that a speaker uses "flying" as a verb in, "Flying planes can be dangerous," but it is interpreted as an adjective by the hearer. Both uses are most likely *semionic* since most speakers/hearers are ordinarily aware of the two possible meanings of the statement. However, the listener assumes that "flying" denotes what it was not meant to denote; that is, what the listener interprets in the message was not explicit in what the speaker intended to communicate from his perspective. The matrix would be:

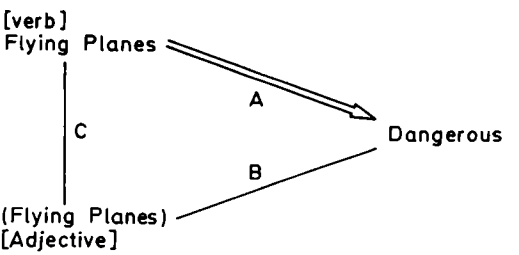


Figure 29

where the Mn "path" A is followed by the speaker and the Mn "path" B by the listener. Communication will not occur since the two "paths" are incompatible. Disambiguation and hence communication between the two parties involved is possible only after each opens the system at a meta-level to introduce the opposing incompatible *semionic* entity. This is accomplished by following the Mf "path" C – the Mf relation is by homonymy: similarity-identity of sound pattern. On the other hand, for the South Sea Islander, mentioned previously, who is ignorant of the fact that humans fly airplanes, the statement cannot be *semionic-symbolic.* It possesses no possible ambiguity.

Now consider this line by Cummings:

(15) He danced his did.

"Did" is ordinarily a verb, but it now obviously is something it would ordinarily not be: a noun. "Did" also is related by alliteration to "jig," which, when used in the same line, renders the statement grammatically correct but rather unpoetical. "Dance" is grammatically correct if used either as a noun or a verb, but it is obviously a verb in this case. The following matrix can be constructed:

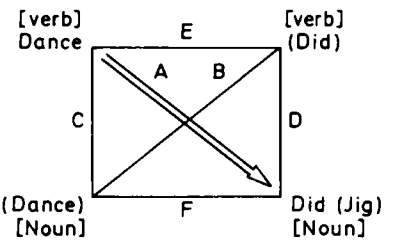


Figure 30

It becomes evident, in this case, that: (a) *metonymical lowering* is necessarily involved in "path" A, since "did" is used in a grammatically deviant way, (b) "path" B can read, "His dance he did," or "path" C, "He danced his dance," both of which are grammatically correct (though the latter is redundant and immediately comprehensible, but at the same time *semionically* irrelevant), and (c) "path" D, reading, "He did his did," appears to be redundant and even meaningless, as opposed to "path" C. Moreover, "Dance" [verb] and "dance" [noun] can be metaphorical only in so far as they are related to the complementary metaphorical system, "did" [verb] and "did" [noun]. metaphor occurs in both cases by means of homonymical "similarity." In addition, the complementary metaphorical system is grammatically deviant, but it also allows for the possible existence of the alliterative pattern between "did" and "jig," hence an alternative poetical convention is followed, although at an implicit level. For an adequate SSS representation of a poetic text, then, inclusion of possible implicit entities in the matrix is necessary in order to perceive the grammatically incorrect but *semionically* conventional nature of the poetic line. It is significant, and indeed it bears mentioning here, that the inclusion of implicit entities is also necessary with respect to scientific and other texts in order to perceive semantically variant but *semionically* meaningful usage of terms.

4.3 Intra-Systemic Permutations

4.31 Consider the possibility that the inderdependency/interaction of SSS-entities at the surface level follows a set of rules. It is obvious that a vast number of TSs can be derived from a relatively sophisticated and relatively complex SSS matrix and from within the same CF. For example, the set of entities in Figure 31(next page) might constitute a subset of a more complex matrix:

From within this system a number of simple statements are possible, each to a greater or lesser degree figurative, such as:

(16) Napoleon is a wolf.
(17) The wolf is hungry.
(18) Napoleon hunts the prey.
(19) Napoleon's hunger will be satisfied.
(20) The rapacious wolf kills the peasants.

or compound statements such as:

(21) Napoleon's rapacious hunger will be satisfied only after he kills the peasants.
(22) The ruthless wolf's ambitions led him to hunt down and devour the peasants.

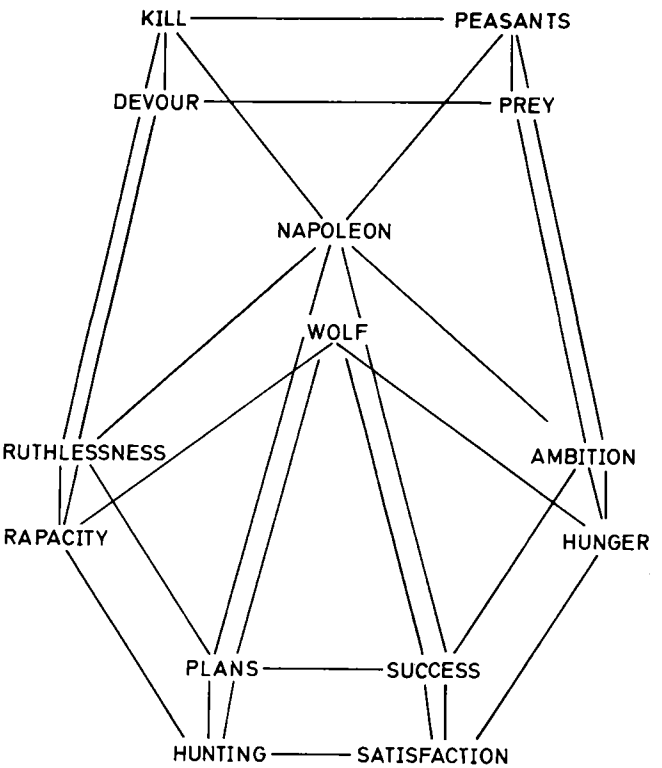


Figure 31

It is evident that given a relatively simple SSS and TS the possible permutations are limited only by the closed sytem. A large degree of superficial variability can be forthcoming without there existing the possibility of any fundamental change of the system itself; that is, unless the system is viewed from a distinct perspective. Hence, as long as the system remains closed and as long as it is viewed from the same fundamental perspective, there cannot be any introduction of new meaningful entities. Neither can there be a radical transformation of the meanings of the existing entities. All variability is limited to combinations and recombinations of the same entities.

4.32 Closed-system variability can be defined by the following rules:

(a) *Associativity.* A string of entities in a closed matrix may combine in a number of different ways. Yet the ultimate outcome of the combinations is, with respect to the sum of the RMn and RMf between those entities

and from the same perspective, fixed. There can be no overall change. In this sense, if the punctuation in the compound statements above is altered, the final result of the combinations remains the same. For instance, (21) could be rewritten as:

(23) *Napoleon* is *rapacious.* His *hunger* will be *satisfied* only after he *kills* the *peasants.*

or,

(24) *Napoleon's rapacious hunger* will be *satisfied.* But this will occur only after he *kills* the *peasants.*

If parentheses are used to represent the punctuation in these satements, generation of (23) and (24) informal symbols is:

(23a) $\underline{a}_1, \lambda\, \underline{a}_2^1\, (\underline{a}_3, \underline{a}_4\, \lambda\, \underline{a}_5^{-1}, \underline{a}_6)$

(24a) $(\underline{a}_1\, \lambda\, \underline{a}_2, \underline{a}_3, \underline{a}_4)\, \lambda\, \underline{a}_5^1, \underline{a}_6$

In other words, linguistic connectives and punctuation are distinct, but the resulting generated string of SSS-entities is in each case identical. Hence:

$$[\underline{a}_1, \lambda\, \underline{a}_2^1\, (\underline{a}_3, \underline{a}_4, \lambda\, \underline{a}_5^{-1}, \underline{a}_6) = (\underline{a}_1\, \lambda\, \underline{a}_2^1, \underline{a}_3, \underline{a}_4)\, \lambda\, \underline{a}_5^{-1}, \underline{a}_6]$$

(b) *Commutativity.* Reversing the order in which a string of SSS-entities is combined does not necessarily change the overall result, even though the formal symbols have been changed. For instance, (18) could be rewritten as:

(25) The *prey* is *hunted* by *Napoleon.*

Statements (18) and (25) are "mirror images" with respect to their SSS strings. That is, formally:

(18a) $\underline{a}_1, \lambda\, \underline{a}_2^1, \underline{a}_3$

(25a) $\lambda\, \underline{b}_1^1, a_1, \lambda\, \underline{a}_2^{-1}$

The two statements are equivalent, or commutative, since the direction of the "path" does not alter the final result. Hence:

$$[\underline{a}_1\, \lambda\, \underline{a}_2^1, \underline{a}_3 = \lambda\, \underline{b}_1^1, \underline{a}_1\, \lambda\, \underline{a}_2^{-1}]$$

That is, (18a) is equal to (25a) in so far as the same "paths" have been crossed, but in inverse fashion. This is the case of the inversions present

in the SSS representation of the active and passive voices mentioned in 4.26.

(c) *Identity.* The combination of any entity in the SSS matrix with an "identity element" gives that entity. For textual matrices the universal "identity element" is the null set, ϕ, since it is always a member of the matrix. It is intuitively obvious that an SSS-entity combined with no other entity in a matrix (that is, combined with the null set) produces only that same entity. "Napoleon!" is a one-word evocation which establishes no necessary relations with other entities in the system other than the null set. In this sense, "Napoleon," if isolated from the matrix, cannot be perceived from the particular perspective implied by that system. It will be the same as stating: "'Napoleon!' (= Napoleon)." Or: "Napoleon!" + ϕ = Napoleon. The meaning of Napoleon in this case can be no more than the equivalent of "dictionary meaning," for the entity is shorn of all its potential SSS-meaning. Hence:

$$[\underline{a}_1 \, \phi = \underline{a}_1]$$

(d) *Inverse.* The reciprocal or inverse of an entity gives the "identity element." The entity is *nullified.* That is,,

$$[\underline{a}_1 \, (\text{-}\underline{a}_1) = \phi]$$

This would be the case of a potential metaphor which, if it does not exist in the matrix, is nullified. For example, to state, "Napoleon is good" from within the perspective of the matrix in Figure 31 is something like stating, "Napoleon is *not* Napoleon," for the entity to which Napoleon is being metaphorically equated cannot be actualized. This is the case since every potentially actualizable metaphor says of the entity to which it is metaphorically equated both what that entity is *like* and what it is *not.* Napoleon is *like* a wolf but at the same time he is what a wolf is *not.* Hence he *is* and *is not* a wolf. In the statement, "Napoleon is good." in contrast, we are told, from within the matrix, what Napoleon is *not,* but we are not told what he is *like* (for the negation implied by all metaphors see Hausmann, 1975).

In sum, from within a relatively complex SSS matrix a surprisingly large number of permutations is possible. Yet, following a limited number of rules, and restricted by the set of entities in the matrix, these permutations are, when viewed in their totality, fixed. Real change can be forthcoming only when: (a) new meanings are attached to one or more entities in the

matrix or new entities are included in the matrix with successive readings of a TS, (b) part of the set of relations in the closed matrix is altered; that is, the matrix is, at a local level, viewed from a distinct perspective, or (c) on rarer occasions, by means of a *Gestalt* "switch," one SSS matrix is replaced at the global level by another, relatively incommensurable, matrix, and hence most or virtually all the key entities undergo meaning transformation.

I now turn to a discussion of such change.

4.4 Aspects of a Diachronic Model of Text Transformations: MODEL B

4.41 For reasons outlined in 3.3, intersections of the Mn-Mf axes result from underlying contradictions (paradoxes), and successive intersections become rooted in new underlying contradictions (paradoxes). This phenomenon occurs at the surface in local domains which become concentrated in the subsurface "nodes" (or "SS-clusters") eventually to form the contradictory or paradoxical base immanent in the underlying structure (the "macromolecular" level) of all relatively sophisticated and relatively complex texts.

With respect to the literary text, for example, word play, puns, jokes, striking new figurative expressions, etc. represent local conditions which may be in a direct or indirect way symptomatic of broader global conditions at the contradictory or paradoxical base. In another sense, surface anomalies that crop up in the scientific text may be, like the proverbial iceberg, indicative of a global paradox at the heart of a broad textual "world model." Similarly, surface contradictions in a religious cosmology may be the manifestation of deep-seated antinomies. And so on.

Fortunately, there is always a tendency to resolve, at conscious and tacit levels, a contradictory or paradoxical situation and hence to "subvert" the system. This can occur by means of an inter-SSS "switch," which alters perception of the underlying "para-realistic" level of the TS. Hence Mn-Mf intersections can represent local "leaps" the cumulative effect of which can ultimately produce *Gestalt* "switches" at the global TS level.

4.42 The objective is now to propose a model with which to account for intra-SSS and inter-SSS transformations in TSs: MODEL B.

DEFINITION 4-IX: A given TS contains a finite number of observables at the surface which consists of two orderings: (a) the sequential ordering of entities ($Mn_1 \ldots Mn_m$), denoted by α, and (b) the parallel ordering of entities ($Mf_1 \ldots Mf_n$), denoted by β.

These surface entities are generated by the SSS matrix generator.

DEFINITION 4-X: Mf entities can exist at various underlying levels of SSS signification, denoted by $[(Mf_1{}^{\varphi 1} \ldots Mf_n{}^{\varphi 1}) \ldots (Mf_1{}^{\varphi k} \ldots Mf_n{}^{\varphi k})]$, where φ represents the successive underlying levels.

These underlying Mf entities combine to make up what I called in 3.54 "SS-clusters." They form holistic "nodes" of meaning at the "para-realistic" level of the text which is ordinarily implicit and can adequately be comprehended only through tacit or conscious culture-world knowledge. Mn entities exist in relations of contiguity at the surface only.

DEFINITION 4-XI: The grouping of underlying Mf entities into "nodes" or "clusters" composes a non-empty family, ψ.

ψ implies a potentially infinite range of possibilities (of text construction in the case of the writer and of text perception [by the analysis-by-synthesis method] in the case of the reader) (cf. 3.41).

DEFINITION 4-XII: $\psi = [(Mf_1{}^{\varphi 1} \ldots Mf_n{}^{\varphi 1}) \ldots (Mf_1{}^{\varphi k} \ldots Mf_n{}^{\varphi k})]$, where the set of "nodes" from a given perspective at a given moment in time is invariably inconsistent or incomplete – and this accounts for the virtual existence of the paradoxical base.

The faimly, ψ, has the structure of a "subtree" (which must be distinguished from surface syntactic "trees" in the Chomskyan sense). The "subtree," branching off from the linear surface of the text, is ultimately rooted in the contradictory or paradoxical base (see Figure 32).

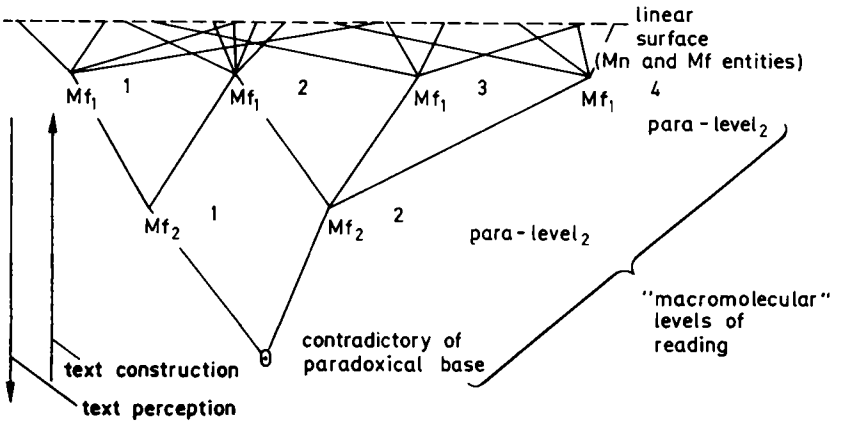


Figure 32

Obviously, many entities and even some entire submatrices are repeated in relatively complex texts. According to Figure 32, a given Mf "node" at a "para-level" can be connected to a number of similar or identical entities and submatrices that may be repeated throughout the text. For example, assume that in a Lévi-Straussian mythical matrix, a submatrix such as, say, the "boiled-meat : culture : : rotten-meat : nature" analogy is presented. This submatrix, which we will call P, is followed by other submatrices, say, Q, R, and S. Then P appears again, which is followed by T and U. Linear generation of the SSS strings for this matrix will continue theoretically in a "recursive" way rather than there being any regress to the original submatrix. Hence the submatrix can occur again and again along the textual matrix.

4.43 *"Evolutionary" change.*

PROPOSITION X: SURFACE (INTRA-SSS) TRANSFORMATIONS occur when:

$$(\alpha, \beta, \varphi) \longrightarrow (\alpha, \beta, \varphi)$$

(Where $\longrightarrow$ denotes, "is transformed into")[3]

This "evolutionary" change entails perception of an unexpected Mn or Mf entity which adds to the TS interpretation fundamentally from within the same perspectival field. That is, the SSS matrix is not altered at the global level since certain surface Mn and Mf entities undergo meaning transitions, but the underlying structure, ψ, remains fundamentally unaltered. Thus the SSS and TS, with respect to the "subtree," remain relatively constant since there are some new intersections of RMn and RMf at the surface only. It follows that these "mini-transformations" occurring at the linear surface level do not effect the "para-realistic" levels of the text, nor are they necessarily a direct consequence of the contradictory or paradoxical base. In this sense, puns and other word play, rhetorical figures, neologisms, new meanings for old terms, new conventions of "symbolism," etc. may be functional with respect to the local level only; they do not manifest the formal features of a global textual transformation which is characterstic of "deep level" SSS "switches" by means of an alteration of the SSS matrix from within a given CF.

Moreover, since the "nodes" of the "subtree" are connected to the structural "distortions" at the local level, it is at these various points in the TS that the "para-reality" can be potentially revealed-reconstructed. In this light, for the potentially infinite TS there must exist a potentially infinite sequence of localized transformations at the surface which are conjoined with underlying "nodes." However, in actual TSs, every possible sequence

of transformations is necessarily limited by the operationally valid connection established by writer and reader. Invalid connections must be re-evaluated and subjected to a new testing. (In this way writer and reader are not limited to prescribed behavior but they are provided a range of possibilities.)

4.44 *"Revolutionary" change.*

PROPOSITION XI: GLOBAL (INTER-SSS) DISCONTINUOUS SHIFTS occur when:

$$(\alpha, \beta, \varphi) \Longrightarrow (\alpha', \beta', \varphi')^4$$

The "revolutionary" change implies a reinterpretation of the SSS from a distinct perspective, and on rare occasions still, it might even compel the reader radically to alter his or her internalized CF. During the global SSS shift a new set of RMn-RMf is established, and consequently there are new underlying lines of connection which form a new "subtree." Hence: SSS ⟹ SSS´. Constituting the set of observables within the TS, it is also radically altered. Hence: TS ⟹ TS´. That is, a new frame of reference applies to TS´ such that it can now be observed in a way which is to a greater or lesser degree incommensurable with the observation of the TS. In this sense, observation O of the TS and observation O´ of the TS´ are likewise relatively incommensurable, although the irreversible sequence, TS ⟹ TS´, demands the alternative possession by the cognizing subject of both O and O´. This implies that the TS and the TS´ can be subsumed within a broader system.

This broader system includes the TS-SUBLANGUAGE and a TS´-SUBLANGUAGE, with each corresponding to its own context. Each is the linguistic projection of a specific textual "world-model" which is by and large incompatible with the other, and both are subsets of a broader "metalanguage." This constitutes a TS-TS´-SUBLANGUAGE in which two "world models" can be alternatively described. In addition, the TS-TS´-SUBLANGUAGE must be disjoint with respect to the TS- and the TS´-SUBLANGUAGES. That is, it is itself a third system which exists at a level distinct from that of the other two. Hence it is impossible to be simultaneously "inside" one of the first two systems and "inside" the third system.

Evidently, the "revolutionary" shift represents a cognitive leap at a global level which encompasses as subsets the sum of all local leaps. Although it is certainly the case that discontinuous "revolutionary" shifts occur rather infrequently at the textual level, these occurrences have repercutions on one's conceptualization of the world or of a possible textual world. This is especailly the case with respect to "world models" underlying scientific

texts (see also Appendix III for reference to a formalized model, "catastrophe theory," which depicts these "revolutionary" transformations).

4.45 An example of an inter-SSS "switch" which ultimately led to a radically new CF.

Hopefully without being excessively schematic, I shall juxtapose the Ptolemaic geocentric universe with the Copernican cosmology. First let us take a look at the Ptolemaic model and its corresponding "para-reality."

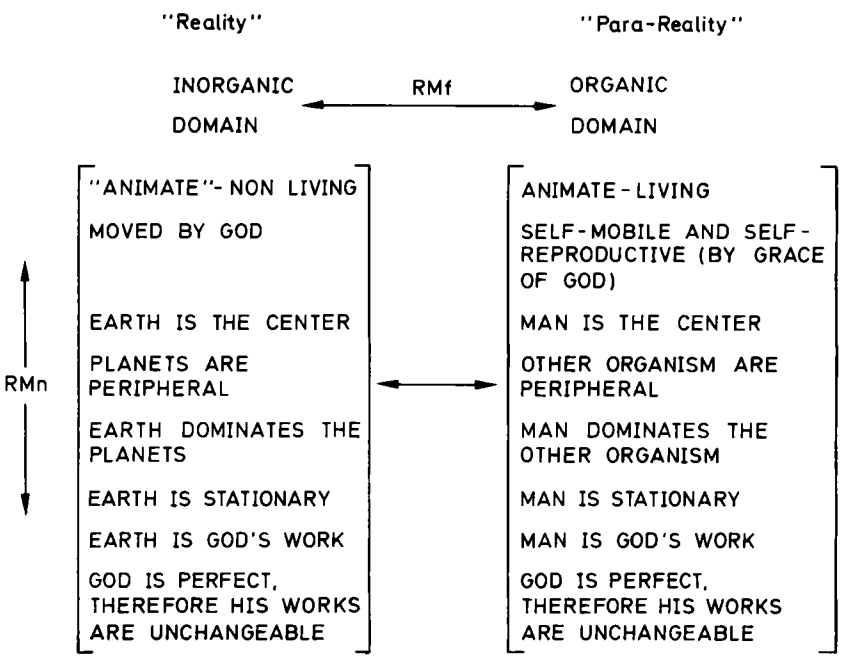


Figure 33

The vertical order of each domain is the abstracted representation of the Ptolemaic universe of discourse which consists of sets of sequential chains ($Mn_1 \ldots Mn_m$). That is, a text written from within this world-view will contain strings of propositions based on axioms, existence theorems, and inferences which are consistent with the Ptolemaic world-view. The parallel relations between the domains involve a particular perception of the world (the inorganic domain $[(Mf_1{}^{\varphi 2} \ldots Mf_n{}^{\varphi k}) \ldots (Mf_1{}^{\varphi k} \ldots Mf_n{}^{\varphi k})]$) which is postulated by analogy. This "para-reality" might be explicit or implicit in a given Ptolemaic text.

The transition from the Ptolemaic universe to the Copernican universe involves a radical recategorization effecting the strings of axiomatic, theoretical, and inferential propositions used from within each respective world-view to describe the world. New meanings of words, definitions of terms, lexical linkages, and in short, new conceptual categories are used to generate a radically distinct image of the world by means of A *Gestalt* shift from one discursive framework to another (see Werner, 1970). For example, to compare some of the "root propositions" between the Ptolemaic and Copernican systems:

Ptolemaic Universe	Copernican Universe
1 – The earth is the center	1 – The sun is the center
2 – The moon is the closest planet to the earth.	2 – The moon is not a planet; it revolves about the earth
3 – The earth is stationary.	3 – The sun is stationary.
4 – The planets revolve about the earth.	4 – The planets revolve about the sun.
5 – The earth is not a planet.	5 – The earth is a planet.

And consequently the order of the planets outward from the center is radically altered:

(a) Ptolemaic Universe: EARTH: →moon→mercury→venus→sun

(b) Copernican Universe: SUN: →mercury→venus→earth (moon)

In the first system the planets (including the sun) are subordinate to the earth; in the second system the earth is a planet and all other planets (but the moon is now not a planet) are subordinate to the sun. This involves a change in the order of parts (structure), and in the order of processes (structural functions). Hence the Ptolemaic cosmology gave way ultimately to the Copernican-based cosmology in which the earth and the entire universe were opened to ever-increasing knowledge, and man and his environment were now conceived to be not immutable but transformable by man's own efforts. Eventually the universe was conceived as infinite and infinitely changeable rather than closed, finite, and immutable.

Interestingly enough, Copernicus' tact, as indeed that of most "revolutionary" scientists, was this. In reality conservative, his theory in many respects did not deviate appreciably from the classical norm. That is, it did not represent a complete CF "switch," and hence his disciples were left with the task of completing the "revolution" (Kuhn, 1957) (compare to the notion of "semantic lag" as described above). On the other hand, Copernicus

used an effective tool of which much of his audience was ignorant: mathematics, a radically new type of SUBLANGUAGE. His work consequently was inaccessible to all but the most erudite astronomers of the day. This obscurity may well have been deliberate in order to buffer all arguments from the uninitiated, for Copernicus remarks in a prefatory letter to the Pope (1952, 509) that "'idle talkers' who take it upon themselves to pronounce judgement, although wholly ignorant of mathematics, and if by shamelessly distorting the sense of some passage in Holy Writ to suit their purpose, they dare to reprehend and to attack my work; they worry me so little that I shall even scorn their judgements as foolhardy."

And later, "Mathematics is written for mathematicians; and among them, if I am not mistaken, my labours will be seen to contribute something to the ecclesiastical commonwealth, the principate of which Your Holiness now holds" (*ibid,* 509). By the time these new ideas became accessible to the general populace their "shock value" had been reduced, for now the public's perceptual readiness was not so incompatible with the new perspective.

4.5 Discontinuous Texts

4.51 *The "subtree" must be generated: from the base to the surface in text construction and from the surface to the base* – with the concomitant analysis-by-synthesis method – *in the case of text perception.*

Prior to discussing the generation of the "subtree" we must specify certain distinctions between the language of the surface-level of the SSS matrix, and the language of the "subtree." First, the natural language system, as is the case of axiomatic systems used in logic, mathematics, and scientific discourse, is recursive (for example, see Wall, 1972). So is the surface-level SSS matrix outlined above. Within a matrix, or within a given logical system, change is possible, but this change consists merely of permutations within the system. That is, one may run through all the possible permutations without effecting an inter-systemic change. In contrast, inter-SSS "switches" constructed/perceived in scientific, religious, artistic, etc. texts are dominated by non-recursive, non-linear, holistic conceptions/perceptions. This entails a different order of change: from one SSS to a distinct and relatively incommensurable SSS. To speak of such change in a TS is to speak of TS "para-realities" at the level of the "subtree."

Although the surface-level manifestation of the TS is relatively "freely created," the underlying level is "environment-dependent." That is, the writer possesses a more or less precisely defined CF which serves to generate the textual "world model." Correspondingly, a reading always begins with

an initial input determined by the reader's own sort of hypothetical SSS-image derived from his or her presuppositions and expectations with respect to a given TS. This SSS-image (re)generates at least part of the basic axioms (fundamental premises) of the TS and, to a greater or lesser degree, it lies behind the reconstruction of the entire TS. Of course, through the reader's analysis-by-synthesis method, this SSS-image will undergo change while the TS is in the process of being reconstructed.

Moreover, the textual "world model," whether speaking of TS construction or reconstruction, is germane to all textual "para-realities." Textual "world models" are realtively determinate in scientific texts, and though at times ambiguously portrayed, they underlie religious and philosophical texts. The text constructor can write from within diverse and contradictory perspectives, and the reader can read various "world models" into most literary texts. This is no problem, however, since the text is not ordinarily considered to be "real" and therefore it presumably need not correspond to the conceived and perceived physical world. It must also be mentioned that the underlying level of the TS is hierarchical in contrast to the surface-level matrix. Contradictions at the surface result ultimately from inputs from the subsurface levels, and those inputs emanate from the contradictory or paradoxical base which is immanent in all holistic textual "world models" to a greater or lesser degree.

In sum, an adequate model of the "subtree" and of SSS and TS transformations must be able to: (a) account for the possibility of multiple readings along distinct "paths" within the "subtree," (b) account for multiple connectives which are non-recursive and non-linear, (c) account for the existence of "para-realities" underlying the surface-level matrix, and (d) account for inter-SSS "switches."

4.52 *Toward a model of the "subtree."*

PROPOSITION XII: The "subtree" is organized in terms of *sets* and *classes* (compare to Minsky, 1977).

This proposition follows from the relationship between the "subtree" and the constructor/perceiver's internalized CF. The "subtree" is derived from within a particular CF (which organizes the world into sets of categories) and, at the global level, the "subtree" operates like a "macrometaphor" or "root metaphor" (which is organized in terms of *sets* and *classes*) (see Pepper, 1942, in epistemology, Beardsley, 1958, in art, and Buchanan, 1962, and Hesse, 1959/60, in science, for similar comments).[5]

The concept which satisfies the above requirements for "subtree" construction/perception is the notion of a set of all possible sets in a system;

that is, the notion of a set of all possible combinations of SSS-entities in a text. The set of all sets consists of the family of all sub-sets of a given set as well as that set itself plus the null set. For example, if a set S contains two entities, { a, b}, then the set of all sets is {{a, b}, {a}, {b}, ϕ}. In mathematics such a set is called a "power set," P(S). By definition a power set is always as large as the number 2 raised to a power equal to the number of entities in the set which the power set is a set of. Hence the number of entities in the power set {a, b} is: $2^2 = 4$. Consequently, the power set allows potentially for an infinite number of sets: infinite generativity of text systems or "unlimited semiosis" can be accounted for.[6]

Consider a simple text consisting of four SSS-entities which compose a set: S ={A, B, C, D}. These entities can be constructed according to Figure 35 (compare to Uttley's, 1954, classificatory model; see also a discussion of it in Singh, 1966).

Notice that the null set exists prior to ABCD. It represents the state before the writer's holistic and instantaneous conception of the textual "world model" which contains novel concepts, thoughts, intuitions, feeling, etc. This is significant, for the writer does not simply begin with the initial SSS-

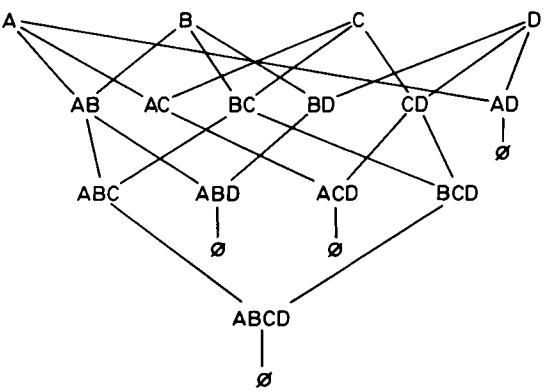


Figure 35

entity in the TS, and then go on to generate sentences in linear fashion without a plan, or hypothesis. The "world model" underlying the TS, then, must be prior to the writing of the initial surface entity. Text generation consequently proceeds "upward" from that point. The reader also possesses certain presuppositions and expectations prior to her reading. She must begin with the first SSS-entity at the surface and proceed "downward."

As she reads she develops hypotheses, and tries them out along the multiple "paths" leading toward the "para-levels." If she is able effectively to make things "fit," she will assume that she has adequately comprehended the TS. However, some "paths" lead to a "dead end" (null set); this indicates an incomplete derivation of textual meaning – which invariably is the case in an extremely complex TS. Therefore a second reading and all consequent readings will tend to add to, but never complete, the underlying "subtree."

The capacity of the TS to "generate," according to this scheme, underlying "para-realities" is accounted for by the possibility of different combinations of subsets of "nodes" from the individual surface SSS-entities. Given the large number of possible combinations, the writer of a relatively complex TS will necessarily be unaware of most aspects of the "para-reality" implied by the surface SSS-entities. Likewise, a given reader of the TS will be humanly incapable simultaneously of perceiving all possible combinations in her holistic (analog) perspective of the TS. Finite means can be used to construct over time a potentially infinite number of combinations in their totality inaccessible to the finite mind at any given moment in time.

Of course, the number of possible combinations in a relatively complex TS is for practical purposes unlimited. But this does not imply that the reader's chance of discovering the "correct" combination is infinitesimally small. The human penchant for somehow "hitting upon" the right answer by intuitive or Peircean abductive processes is responsible for the generation of surprisingly parsimonious and elegant conceptual constructs (cf. Peirce, 1960, 1.180-1.194).

4.53 *An example.* Consider once again the riddle: "What is (part) black and (part) white and (all) red?" Initially the system contains three entities which I shall denote: a_1 = (part) black, a_2 = (part) white, and a_3 = (all) red. The possible combinations are: $\{\{a_1, a_2, a_3\}, \{a_1, a_2\}, \{a_1, a_3\}, \{a_2, a_3\}, \{a_1\}, \{a_2\}, \{a_3\}, \phi\}$.

On considering the set of all possible combinations in the riddle, $\{a_1, a_2\}$ is "logical," hence no problem is as yet evident. However, $\{a_1, a_3\}$, $\{a_2, a_3\}$, and $\{a_1, a_2, a_3\}$ present a contradiction which must be resolved. Even though the sentence is syntactically correct it is semantically contradictory with respect to the entire system. Resolution of the anomaly is possible only after "opening" the system by inserting "read," and consequently a new "power set" is implied with $2^4 = 16$ entities. The inclusion of the new entity entails two systems (see Figure 36, next page). The contradiction existing in the smaller frame can only be resolved from within the broader meta-frame. Now, from this broader perspective the contradiction can be viewed as relatively trivial, and a solution is readily forthcoming since from the larger frame the solver of the riddle is able to bring into awareness the two juxtaposed systems.

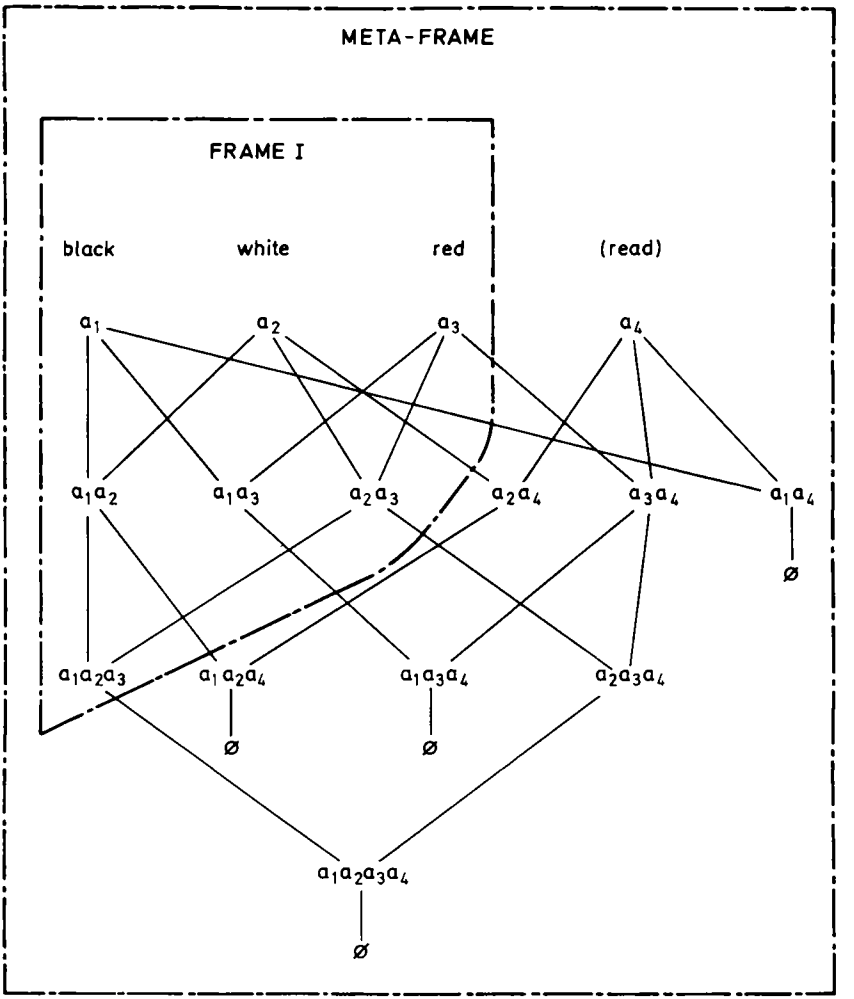


Figure 36

4.54 The total classification of a relatively sophisticated and relatively complex text by means of the set of all possible combinations of SSS-entities as described above may be intuitively appealing as an idealized formal model, yet it is operationally inadequate for the following reasons:

(a) Given the limited capacity of the average human being, only a small number of the surface textual entities will at a given instant be available for constructing a classificatory scheme or a holistic image of the text.
(b) All human beings automatically and tacitly employ a powerful set of economies in reducing the necessity of a complete classification of all possible items of experience in the perceived world by selecting broad analogs or "chunks" of data.
(c) If classification entails perception of broad analogs or "chunks," then individual SSS-entities in texts are pigeon-holed, according to a given CF, at a level which is yet higher than that of the analogs or "chunks."
(d) This higher-level classificatory mechanism presupposes the ability to construct/perceive the textual "distortions," "critical points," and condensed "clusters" or "nodes" of meaning as described above.
(e) The textual phenomena mentioned in (d) require *that some SSS-entities be more meaningful than others, that they be more specifically connected to the text's underlying set of "root propositions" and "world model."* Hence they are crucial toward an understanding of the higher-level analogs or "chunks" (see Kintsch, 1974, and van Dijk, 1978, with respect to "chunks" or "root propositions" underlying texts).

The next task, then, is to describe a model with which to account for this higher-level of text perception wherein the more meaningful SSS-entities are singled out.

4.55 *Toward a model of diverse readings at the "macro-molecular" level of the "subtree."* A particular "reading" at the higher-level of analogs or "chunks" must be in some form or other "generated." The question is: How?

Consider a text wherein at the outset two key "nodes" of underlying "para-realistic" meaning are *law-magistrate.* The *law* is conceived as a code drawn up to *protect* the citizen' rights, and the *magistrate* is a *friend* of the public who doles out *justice.* At a "critical point" in the text a transformation occurs, either at a relatively explicit or implicit level, such that the *law* becomes a *repressive shield* of the *establishment,* and the *magistrate* becomes the *enemy,* an authoritarian *father-figure.* The text is now, after this transformation, open to a "more complete" reading.

Informally this SS-system transformation is: [*law-protect – magistrate-friend*] ➡ [*law-shield – magistrate-enemy*]. The next step is to demonstrate formally how it is possible for the reader to arrive at a state of awareness of this transformation by diverse means (or "paths" at the "subtree" level).

PROPOSITION XIII: A derivation of the interrelated and interdependent

"nodes" in a "subtree" by a specific reading from a particular perspective can be defined in terms of *mappings.*

Consider that a given reading of the SSS is a *function* of the "subtree." In this sense the surface linear *string* of SSS-entities is reduced to a "node" at the "subtree" level, and the surface SSS *derivation* of those *strings* is reduced to a set of *functions.* Thus the linear system becomes hierarchical, and the "subtree," containing implicitly or explicitly a "world model," is constructed and connected to surface SSS-entities by means of a set of potential "paths."

Let a reading of the above hypothetical text consist of a set of possible "mappings" from surface SSS-entities into/onto their correspondent underlying "nodes" at the "subtree" level. These "mappings" can be represented by three diagrams:

(a) [*law-protect – magistrate-friend*] ⟶ [*law-shield – magistrate-enemy*]

magistrate

(Where the heavy arrows denote "mappings" or "reading")

(b) [*law-protect – magistrate-friend*] ⟶ [*law-shield – magistrate-enemy*]

law

(c) [*law-protect – magistrate-friend*] ⟶ [*law-shield – magistrate-enemy*]

magistrate-law

In (a) there is transformed meaning of *magistrate* only, and in (b) of *law* only. Consequently, unlike (c), they are incomplete readings. With respect to (a), the two meanings of *magistrate* are derived by following the appropriate "paths" ("mappings") from the surface sets, and in (b) the two meanings of *law* can be derived in the same manner. (c), on the other hand, requires awareness of the transmuted meanings of both terms. What must now be described is the process of "subtree" reconstruction during the act of this more complete reading.

Let the SSS-entities discussed in the above hypothetical reading be replaced by the following abstract "symbols."

(16) *law-protect* = γ
law-shield = μ
magistrate-friend = γ'
magistrate-enemy = μ'

The two derivations of meaning of the text are:

(17) X: $\gamma \longrightarrow \mu$
Y: $\gamma' \longrightarrow \mu'$

That is, there is a transformation from one level of SSS signification to a new level, which can be represented graphically:

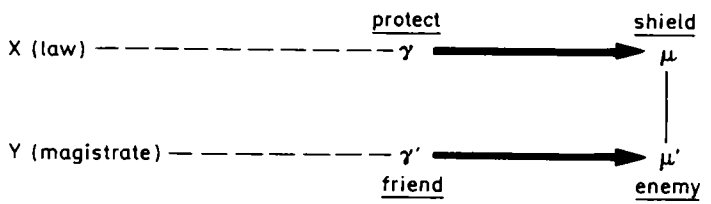


Figure 37

However, a given reading of a text is ordinarily not so clear-cut as indicated in Figure 37. There also exists a possible set of "diagonal" associations from (*protect*) to (*enemy*), and from (*friend*) to (*shield*). Each of these associations constitutes also a partial transformation of the TS the sum of which is the complete transformation. Hence there exists in any relatively sophisticated and relatively complex text a number of possible "paths" leading to a relatively complete reading.

To illustrate a set of alternative "paths" in the rather simple hypothetical TS under consideration, let transformations X and Y in (17) be extended to show possible derivations by means of the following set of combinations.

(18) $X_1: \gamma\gamma' \longrightarrow \mu\gamma'$
$X_2: \gamma\mu' \longrightarrow \mu\mu'$
$Y_1: \gamma\gamma' \longrightarrow \gamma\mu'$
$Y_2: \mu\gamma' \longrightarrow \mu\mu'$

A relatively complete reading can be forthcoming only after the occurrence of either transformation X_2 or Y_2, with the consequent production of (*shield-enemy*). And these two readings can take place only in conjunction with the complementary transformations X_1 and Y_1, since μ' is absent at the left of Y_2 and μ is absent at the left of X_2. Hence there are two possible "paths": one derived from X_1 and Y_2, and another derived from X_2 and Y_1.

Some remarks follow from the above:

(a) Numerous "paths" in the system lead to the same result. The "path" followed depends upon whichever set of associations is established.

(b) The condensed "nodes" of meaning and the "critical point(s)" of a TS can be encountered at different places during alternate readings, depending upon which "paths" are followed. If the "message" in the TS is relatively explicit and part of a large number of two readers' shared commonplace associations, then the same "nodes" and "critical point(s)" will have a high probability of being perceived.

(c) The sum of the possible "paths" represents potentially a global "switch," a reformulation of the underlying textual "subtree," and concomitantly a new way of perceiving the textual "world model." This change cannot occur at the superficial level only. The SSS-entities making up the underlying "nodes" are, at the moment of the SSS "switch," automatically re-evaluated, and a new "subtree" is consequently constructed. For instance, with respect to the relatively simple hypothetical TS under discussion, *law* and *magistrate* are, after the necessary TS reconstruction, placed in a new light. They no longer have the same meaning since the figurative SSS-entities to which they are directly related have suffered transformation. Hence: SSS ➡ SSS′, and TS ➡ TS′.

4.56 *An example from a literary text.* Reconsider Borges' short story in light of the reading mechanism described above. At the "critical point" of the text, wherever that may be for a given reading, there exists the possibility for a key set of "nodes" to undergo transformation. Subsequently there is potential awareness not only that the Magician's desired goal is thwarted, but also that the "logical" end will prevail by virtue of the text's underlying paradoxical base. In this sense, a relatively complete reading of this cognitive aspect of the text must include awareness of key "nodes" which depict a contradictory set of entities: temporality/timelessness, essence/nonessence, "reality"/dream, and ontological-status-of-father/ontological-status-of-son. At the outset the reader, with his consciousness embedded in a Cartesian subject/object world, might naturally assume that these "nodes" represent all-or-nothing contradictions. In the end, however, he potentially becomes aware of the "supernatural" quality of the text. These were not contradictories at all, they must be construed as congruences.

Hence the following potential transformations can be actualized:

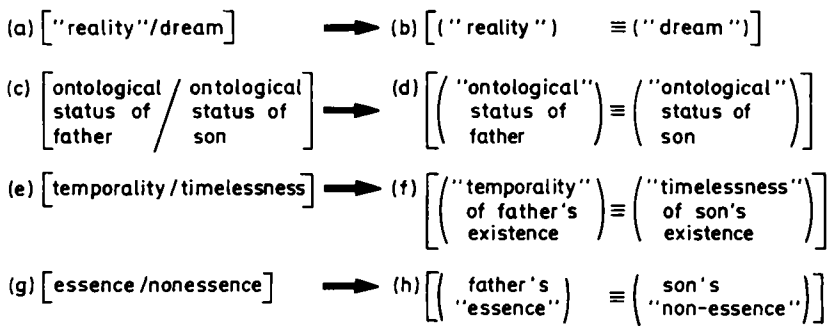


Figure 38

Change in the relationship between these "nodes" radically alters their meanings; they are now part of an "irrational reality" which certainly does not follow what was originally perceived to be the magician's "logical" construction of the world. After the transformation of these "nodes" has been realized, the meanings of all other complementary SSS-entities in the text are transformed, since a totally new taxonomy is implied by the altered meanings, of the existing "nodes" in the above schema. Hence: $\psi \Longrightarrow \psi'$, SSS $\Longrightarrow$ SSS′, and TS $\Longrightarrow$ TS′.

In order adequately to arrive at an awareness of this transformed TS, derivation of meaning through at least four "paths" must be followed:

(22) K: a $\Longrightarrow$ b
L: c $\Longrightarrow$ d
M: e $\Longrightarrow$ f
N: g $\Longrightarrow$ h

With respect to the total system of interacting SSS-entities, the possible extensions of transformations K, L, M, and N represent an exceedingly large number of alternative "paths." For example, reading R_1 follows one "path," then a subsequent reading, although deriving basically the same meaning or even a radically distinct meaning, follows another slightly different "path." This is reading R_2. R_1 conjoined with R_2 gives a more complete reading: $R_1 \cup R_2 = R_{12}$. Multiple perspectives are acquired after conjoining the composite paths of many readings from diverse angles: $R_1 \cup R_2 \ldots R_n = R_{12 \ldots n}$. But, of course, the task can never be complete for relatively sophisticated and relatively complex texts.

(There is no need, nor is it possible, to enumerate all the alternative local "paths" by means of which the reader can arrive at a complete perspective of the TS. Overformalization would serve no purpose. The model, I believe, demonstrates sufficiently well that relatively complex texts are interpreted by a human cognitive mechanism that, though in essence economical, is capable of combining over time an extremely large number of SSS-entities in a quasi-unlimited number of ways into a large number of potential taxonomies.)

4.57 *MODELS A and B imply two types of change.*

What I have sketched out in this and the preceding sections entails fundamentally two types of change: $CHANGE_1$ within the "surface" RMn-RMf matrix (MODEL A), and $CHANGE_2$ where the "subtree" undergoes a radical alteration (MODEL B). $CHANGE_1$ is change from within the sytem; $CHANGE_2$ involves a breach of the system (see also Watzlawick, Weakland, Fisch, 1974, for discussion of these two types of change within a broader context).

However, it must be kept in mind that neither $CHANGE_1$ and $CHANGE_2$ nor MODELS A and B are mutually exclusive. There is constant interaction and interdependency between them. SSS-entities exist at the "surface" where they are accessible to the consciousness of the text constructor/perceiver. At the same time they potentially exist at the "nodes" below the "surface" where they are partly consciously and partly tacitly constructed/perceived. I have called them "nodes" because SSS signification at this level is in essence *condensation.* Within the "subtree" a "root metaphorical proposition" which implies the textual "world model" can be the equivalent of a large number of sentences at the textual "surface." Descartes' "machine metaphor" of which a matrix was constructed above is an example of a "root proposition" in a scientific text. The paradoxical injunctions in Borges' and Fuentes' works constitute "root propositions" in fictional texts.

Let me illustrate further this notion of metaphorical *condensation* by referring once again to the distinction I have established between culture-world knowledge and dictionary knowledge, or correspondingly, between SSS signification and linguistic or literal meaning. SSS signification, constructed/perceived from within a CF by means of culture-world knowledge, constitutes a broad, holistic fabric of inseparable, interdependent, and dynamically interacting entities. On the other hand, dictionary knowledge used to derive the meaning of linguistic entities is, at least in the sense of Katz and Fodor relatively "atomistic." This distinction is similar to the distinction Vygotsky (1962, 146) establishes between the *sense* of a word and its *meaning:*

The sense of a word . . . is the sum of all the psychological events aroused in our consciousness by the word. It is a dynamic, fluid, complex whole,

which has several zones of unequal stability. Meaning is only one of the zones of sense, the most stable and precise zone. A word acquires its sense from the context in which it appears; in different contexts, it changes its sense. Meaning remains stable throughout the change of sense. The dictionary meaning of a word is no more than a stone in the edifice of sense, no more than a potentiality that finds diversified realization in speech . . . . A word derives its sense from the sentence which in turn gets its sense from the paragraph, the paragraph from the book, the book from all the works of the author.

In other words, *meaning* as Vygotsky uses the term is derived from dictionary knowledge, while *sense* pertains to culture-world knowledge. Knowledge of culture-world allows one to know when a particular word can be used and what *sense* can be attached to it in particular social contexts. Or, it allows one to know how to use/perceive the proper words in the context of a text such that they will take on the desired *sense.*

Vygotsky goes on to say that in the context of an entire discourse, word *senses* "flow into one another." *Sense* is reciprocally absorbed such that certain words in a text become *condensed:* they embody underlying textual "root propositions." They can even come to "represent" an entire discourse:

Thus, a word that keeps recurring in a book or a poem sometimes absorbs all the variety of sense contained in it and becomes, in a way, equivalent to the work itself. The title of a literary work expresses its content and completes its sense to a much greater degree than does the name of a painting or of a piece of music. Titles like Don Quixote, Hamlet, and Anna Karenina illustrate this clearly; the whole sense of a work is contained in one name (Vygotsky, 1962, 146).

Vygotsky is of course speaking of that portion of a text which is available to consciousness. According to my above formulation, portions of the "root propositions" underlying the text may exist at a tacit level. Also, part of what might have originally been explicit can become concealed through the process of embedment, or conversely, what was concealed can be revealed by making it explicit: de-embedment. Hence, CHANGE_2 can occur when what previously existed partly at "deep" and nonconscious levels becomes de-embedded. CHANGE_1 occurs chiefly at "surface" conscious levels and by following nonconsciously and tacitly the so-called "pathways of least resistance."

4.6 The System Seen From Above

4.61 There exists a four-fold symmetry between many of the key concepts developed in the above study. This symmetry can be correlated

with Peirce's (1960, 5.388-5.410) description of four steps which lead us eventually to action.

We begin with *sensations,* that which is susceptible to immediate consciousness. Sensations are sequential, a stream of sensory images "which flow through the mind." The occurrence of sensations leads to *thought.* Thought is atemporal and synchronic, but unlike sensations, it involves "some portion of the past or future. Thought is a thread of melody running through the succession of our sensations." The entire melody, like thought, is holistic: it is an interrelated composite of sensations. When thought becomes sufficiently concise it is crystallized into *belief* (in a paradigm or a CF). Belief "is the demi-cadence which closes a musical phrase in the symphony of our intellectual life." It involves the eventual establishment of modes of *action.* Action is habit, the disposition to say and do things spontaneously and in a certain way. Habit becomes a set of pathways of least resistance. In this sense, the final upshot of thought, which is derived from sensations, "is the exercize of volition, and of this thought no longer forms a part."

4.62 Now, place *sensation* in category (A) with:

(a) Receptivity (to sensory stimulii).
(b) The "conscious willingness to suspend disbelief" (P & Q).
(c) Perception without preconception (→ awareness of fictions, of "as if" realities).
(d) Chaos (a stream of undifferentiated inputs).
(e) No organization.
(f) Undifferentiated continuum.
(g) No equilibrium.
(h) Stasis.
(i) No change in conceptual framework.
(j) Synchrony (immediate sensations are not connected to past or future).

Place *thought* in category (B) with:

(a) Projection (of the mind into the sensory stimulii being received).
(b) The "conscious unwillingness to suspend disbelief" (P & ~Q).
(c) *Semionicity* (or the process of "demythification" whereby *symbols* are replaced by *semions*).
(d) Potential for a *Gestalt* "switch."
(e) High logical typing (→ ordered simplicity).
(f) Disequilibrium.
(g) Potential for morphogenesis (cf. 0.13).
(h) Potential for CHANGE_2.
(i) Synchrony (thought mediately connects past and future sensations to present).

Place *belief* in category (C) with:
(a) Receptivity (of the [new] paradigm or ontology which was created as a product of thought and by means of an "irrational" *Gestalt* "switch").
(b) The "non-conscious willingness to suspend disbelief" (~P & Q).
(c) "Mythification" or embedment (*semions* are replaced by *symbols*).
(d) Steady state.
(e) Movement toward organizational complexity.
(f) Equilibration.
(g) Homeostasis (cf. 0.13).
(h) Paradigm or conceptual framework embedment ($CHANGE_1$).
(i) Diachrony (the accumulation of previous thoughts leads to the disposition to believe and to act on that belief).

Place *action* in category (D) with:
(a) Projection (of the paradigm [or CF] into the perceived world).
(b) The "nonconscious unwillingness to suspend disbelief" (~P & ~Q).
(c) Nonawareness of fictions, of "as if" realities.
(d) Steady state.
(e) Organizational complexity.
(f) Equilibration.
(g) Homeostasis.
(h) Habit-spontaneity ($CHANGE_1$).
(i) Diachrony (the accumulative reinforcement of belief leads to habitual action).

The entire scheme looks like Figure 39 (see page 182). And the "evolution" of these categories with respect to general conceptual systems is: (A)→(B)→(C)→(D).

The scheme appears to be linear, acyclical, final. However, as we shall see, this is not so.

At an extremely primitive level, (A) might entail relatively passive receptivity of sensory images. However, as pointed out in Part 3, (A) does not and cannot merely indicate the passive reception of sensations; it is not a Baconian form of induction. Piaget shows us that during early development the child progresses from *observation* to *action* on his environment. But this development occurs in stages. The child becomes aware of and presumably formulates for himself the "natural" laws of space, time, causality, conservation, etc. And as his mental structures become increasingly complex and sophisticated he acts on his environment from within the framework of these laws. He no longer receives the world passively. (A), then, occurs in an increasingly complex hierarchy of levels. How does one undergo the transition from one level to another?

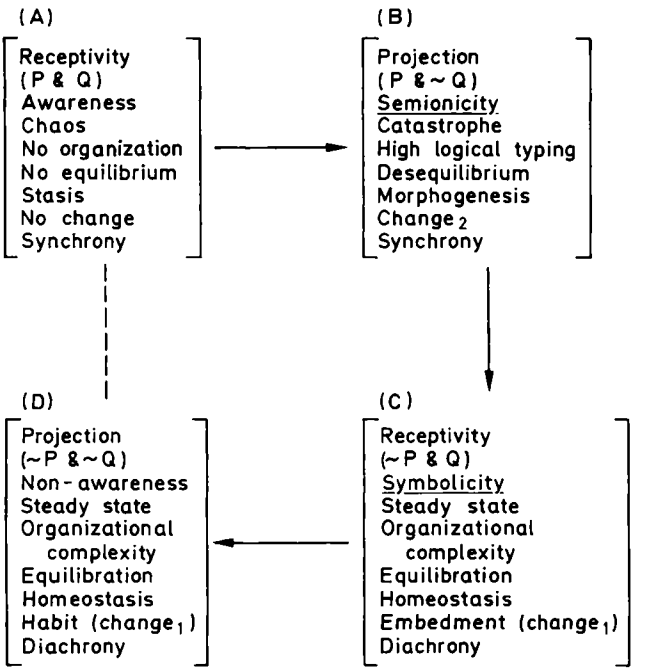
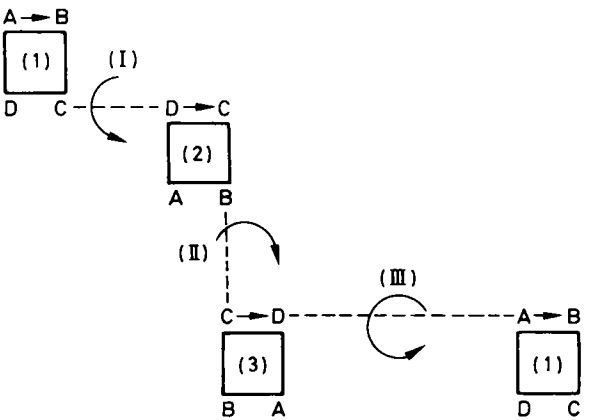


Figure 39

(P & Q), it will be recalled, was discussed in light of the reading of literary fictions. This activity entails the reader's oscillation between his physical world as he perceives and conceives it and the possible or impossible world of the fiction before him. *Oscillation* between two worlds, paradigms, or CFs creates the potential for placing oneself precisely inside the "meta-paradigmatic frame" (MPF). From within this frame a *Gestalt* "switch" into a new paradigm or CF can be forthcoming [category (B)] which can thereafter be subjected over time to embedment [category (C)] and then habitual action can gradually ensue within what has now become a closed, dogmatic system [category (D)]. Hence (P & Q), through the transformations outlined in Part 3, is the means by which a "switch" from a given CF in the *action* category to a distinct CF can possibly occur. Therefore the scheme is not linear. It is dynamic and helicoid-like: an ongoing process.

Now, all forms of cognition do not necessarily begin with (A) and progress to (D). If we place the four categories in a tetrad and invert it we have the following *permutations* (see Figure 40, next page). Mathematically, an interesting property of these inversions is that any two are equal to the

third. (I) plus (II) is equal to (III), (III) plus (II) is equal to (I), and (III) plus (I) is equal to (II). These operations are perhaps not as trivial as they might appear. Notice that in tetrad 1 the progression is: (A) → (B) → (C) → (D). On the other hand, 2 begins with (D) and 3 with (C). Can this signify anything of importance?



(Where Arabic numerals denote the tetrads and Roman numerals denote the operations.)

Figure 40

Progression in (2) is the same as if we started at (D) in (1) and moved in a counterclockwise rather than a clockwise direction: the entire process is reversed. One begins with *habit* or *action,* then moves to *belief, thought,* and finally to *sensations.* That is, we begin with habitual (or perhaps even instinctual) action which entails a set of expectations. We encounter the unexpected, which requires us to re-evaluate our belief – our (by now) tacit adherence to a given paradigm or conceptual framework. We become aware of the concealed *symbolicity* in that paradigm or conceptual framework in so far as it is an "as if" reality, a possible world. And finally, we are able to "see" the world or a given aspect of the world without the nonconscious preconceived notions we once possessed. The process can now be once again reversed. It is worthy of note that (1) entails conceptualization, by a process of *hypothesis* formation and its verification, of items of experience in the world. In contrast, (2) entails de-embedment of embedded *hypotheses* or of nonconsciously possessed conceptual constructs.

On the other hand, (3) begins with *belief.* It is the equivalent of formal indoctrination by teachers, parents, pastors, priests, etc. concerning the

way the world is or is supposed to be. For example, the science or mathematics student, as Kuhn, Feyerabend and Lakatos tell us, is by and large handed a set of principles as if they constituted the one and only undeniably true picture of the world. It is as if these principles suddenly appeared out of the clear blue sky, or as if they were dictated to man by the gods. There is little or no exposition concerning the long and painstaking process by means of which scientific, mathematical, or other discoveries came about. The student is simply required to attend to the magical conjuring act in which his instructor is engaged "without asking questions either about the background or about how this sleight-of-hand is performed" (Lakatos, 1976, 142). How true this also is of much of the social sciences and the humanities!

By formal instruction, then, one begins with *belief* in a system. It must be believed because authority dictates that it is so; therefore that is the way things are. Then embedment occurs, and habitual and spontaneous action becomes the norm. It is only after a "switch" from (D) to (A) that one can begin construction, from "scratch" so to speak, of a radically distinct CF (and indeed this rarely occurs since we are usually properly indoctrinated).

Admittedly, the system I have suggested in this section is speculative. Nevertheless, the harmony and simplicity that appears evident between the set of concepts involved is, I would conjecture, not sheer coincidence.

Notes

1. On the other hand, with respect to the conventions of poetic SUBLANGUAGES, the syntactic chain along a strophe can set up sound patterns which, in context, produce figurative meaning. In this case, the phonetic aspect of language, in addition to the visual aspect of linguistic signs or SS-system entities as marks-on-paper, plays a role in the proper construction/perception of the text. This characteristic is, of course, minimal to null in other classes of texts.
2. It bears mentioning here that the proposed matrix generator does not conflict with the implicit and unformalizable aspect of Wittgenstein's culture-bound and *Weltanschauung*-bound "language-games" within general "forms of life" (cf. 0.12). The model being constructed here is strictly computational, having nothing to do with the content of specific SSS entities in a matrix. It represents an attempt to explain formally what it is that we do when we construct/deconstruct SSSs; that is, when we generate/perceive novelty in the language of texts. The meaning of particular SSS entities depends on the perspective of the perceiving subject.

   Consequently, according to the epistemological framework adopted in this study, a particular reading, in addition to being language-bound, culture-bound, and *Weltanschauung*-bound, is context dependent and hence impredictable. Contexts can be studied historically, and cause-and-effect conditions might possibly be described for them, but is impossible to determine what particular context will exist at a particular future time and place. For example, twentieth century philo-

sophers of science can be aware of the transitions between the Newtonian and Einsteinian paradigms, but a pre-Copernican could possess no awareness of such a possibility. For further argument along these lines see Merrell (1982).

3. The "evolutionary" process is somewhat analogous to Kuhn's "normal science" or "puzzle solving" science in so far as the set of expectations brought to bear when approaching the text are not fundamentally altered. The reader continues to "see" the text through basically the same eyes.
4. Global "revolutionary leaps" in the text correspond in a rough way to Kuhn's "paradigms," Foucault's "epistemes," Althusser's "epistemological breaks," and Feyerabend's scientific "theories." In all such cases *a priori* expectations are discarded and a new CF as well as a new set of expectations is adopted.
5. Of course, the linguistic text system must be generated and perceived linearly. However, I must at this time remain at the level of the construction and perception of hierarchically ordered sets and classes.
6. In line with the formal notion of a power set, it can be stated that even though the writer organized all the textual entities into a set, that set is not equal to the power set of that set. In other words, if A is a set then $A \neq P(A)$. The formal proof of this statement is as follows:

   If A is a set, then $A \neq P(A) \longleftrightarrow \exists x\,(x \in A \wedge x \notin P(A)) \vee \exists x\,(x \in P(A) \wedge x \notin A)$. Let it be assumed that $\exists x\,(x \in P(A) \wedge x \notin A)$. Then $A \in P(A)$, according to the definition of a power set. It is a fundamental principle of set theory that no set can be a member of itself (from Russell's theory of logical types). Thus $A \notin A$. Since $A \in P(A) \wedge A \notin A$, then $\exists x\,(x \in P(A) \wedge x \notin A)$. (Notice that in the proof a value for x was exhibited, specifically, $x = A$, such that $x \in P(A) \wedge x \notin A$).)

The writer who writes the text containing A entities was over a period of time aware of each and every entity. And the reader who carefully reads the text is through time aware – either in a literal, *semionic*, or *symbolic* sense – of each and every entity. For reader and writer to commit to memory each and every entity in a moderately complex text is not beyond human capacity. However, to be *simultaneously* aware of each and every entity as well as all their possible combinations and all possible paths between them is, with respect to the relatively complex text, humanly impossible. No more than a relatively small set of entities, combinations, and paths can be perceived from a given perspective and from within a given CF. Therefore it can be stated in an informal sense that P(A) for the relatively complex text containing A entities cannot be perceived in simultaneity by a finite human being. Only an erroneously conceived Laplacean Superintelligence could possess such capabilities.

Postscript

I have attempted to establish underlying mechanisms for constructing and perceiving all texts. I have not discussed at length the differences between *types* of texts. Many problems are left untouched, especially with respect to literary texts. Literary phenomena such as plot, theme, character, point of view, setting, dialogue, style, irony, satire, etc., set the literary text apart from all others. These phenomena remain to be analyzed. But, then, theoretical discourse on literary text typology is not within the scope of this study.

Neither have I demonstrated precisely how *any* analyst, using what are proposed to be operationally adequate techniques, can theoretically derive the *only* consistently valid description, explanation and even interpretation of *any* text. Such has not been the chief goal of this study for an important reason: the ideal I seek at this point is not total consensus of theoretical views and repeatability of operationally adequate and reliable techniques. That is fortunately not now nor will it ever in the future be the case, since "Science is not a system of certain, or well-established statements; nor is it a system which steadily advances toward a state of finality" (Popper, 1959, 278). The ultimate statement can never exist in any science. What is possible is the construction of a set of theoretical statements which can be evaluated, improved upon, and sometimes rejected and replaced by new statements or occasionally by a totally distinct view of the domain to which those theoretical statements refer.

We can never know absolutely. What we can do and in reality do in all walks of life is guess, construct hypotheses, check them, test them, reject them, and start anew. This is the game of theorizing, even at the most trivial level. This is the game I have, in my own small way, attempted to initiate.

Theorizing and criticism of theories *ad infinitum* is not a self-defeating game. It is an affirmation of the perpetual openness of all systems, theoretical or otherwise. If absolute certainty were attained, then dogma would undoubtedly follow the establishment of those ultimate "truths," and totalitarian mentalities would prevail. In such a state of affairs systems would

be eternally closed. We must at all costs prevent this from occurring.

Ideally, therefore, this is how to go from here – and this is how to improve (or remove) a (my) theory:

Two avenues are open.

(a) *Epistemological.* Is there a flaw in the internal logic of the theoretical construct? If so, how can we find it and improve the theory?

(b) *Empirical.* Is the theory inconsistent with data from real-world texts? If so, how can the theory be altered such that it corresponds more adequately to empirical evidence?

Concerning the first enterprise, counterarguments must be provided by means of "thought experiments" from hypothetical situations. These counterarguments can reveal internally inconsistent conjectures in the original theory. Naive conjectures and assumptions are rejected and replaced by others while not-so-naive conjectures and assumptions are salvaged and improved upon. Finally, the counterarguments are turned into new arguments; new fields of inquiry present themselves.

The second project involves the development of operationally adequate techniques: empirical testing. Data can be cited *ad nauseum* to support a theory. The necessary task is to produce counterdata with which to demonstrate that certain texts exist which cannot be accounted for by the formal and the substantive aspects of the theory. By means of counterdata the theory is subjected to revision, or if that is not feasible, to rejection – but subsequently it must be replaced by an alternative theory.

Perpetually to critique our own and other's premises, that is the task of an adequate text semiotic.

I hope that now all of you see that proofs, even though they may not *prove,* certainly do help to *improve* our conjecture.

The "Teacher," in Lakatos (1976, 37)

We try to discover new problems raised by our theory. But the task is infinite, and can never be completed.

Popper (1974, 28)

I earnestly beg that whoever may detect any flaw in my reasoning will point it out to me, either privately or publicly; for, if I am wrong, it much concerns me to be set right speedily.

Peirce (1955, 338)

APPENDIX I

Toward a Typology of More-or-Less "Incommensurable" Systems

According to the hypothesis put forth in this study, a greater or lesser degree of "incommensurability" exists not only between scientific CFs but between all CFs and their corresponding SS-systems and SUBLANGUAGES. Assume that this incommensurability varies in degree when proceeding from scientific to metaphysical to artistic CFs, SS-systems, and SUBLANGUAGES. In this sense incommensurability can be placed along a spectrum progressing from "weak" to "strong," where "semantic lag" is relatively great at the "weak" extreme and small at the "strong" extreme. *Symbolic* discourse predominates in weakly incommensurable systems. Texts written from within these systems consequently tend to be enshrouded in mystery, the ineffable, hidden inconsistencies, and inexplainable "symbology." *Semionic* discourse prevails in strongly incommensurable systems from within which relatively explicit and explainable texts are constructed. Consider the following typology:

(a) NATURAL "SYMBOLS." Stringently motivated general "symbols" pertain to the strong pole where "symbolization" is homologous with respect to all human cultures. For instance, the body is a source of predetermined and highly motivated "natural symbols" such as right/left, high/low, symmentrical/non-symmetrical, etc., which predominate in "primitive" ritualistic behavior, and are still evident even in the most "modern" conceptual systems (Douglas, 1966, 1973; Hertz, 1960; Needham, 1973). Such "symbols" provide an analogy between the human physiology and cultural-bound conceptual systems. Consequently, they are used and interpreted in basically the same way throughout the world. In this sense we can imagine that a Martian possessing a radically distinct physiology will encounter difficulty understanding certain statements we might utter even though he has acquired the grammar rules and extensive vocabulary in one of our natural languages. His "natural symbol system" would be incommensurable with ours.

(b) CROSS-CULTURAL SYSTEMS. Incommensurability is less strong when contrasting a set of conventions governing knowledge of culture-world

in a "primitive" community with those of a "modern" community. For example, consider Levi-Strauss' (1966) distinction between "concrete science" and "abstract science," Horton's (1967) "closed society" and "open society," Levy-Bruhl's (1926) "prelogical" and "logical" mentality, and Goody's (1977) "oral cultures" and "literate cultures." Similarly, Althusser's (1970) "epistemological break," marks what seems to be an all-or-nothing distinction between the "pre-scientific" and the "scientific" mentality. The same degree of incommensurability appears also to exist between the holistic cosmological *Weltanschauungen* of two radically distinct cultures: Eastern and Western (Northrop, 1959; Watts, 1963).

However, a minor degree of "overlap" invariably exists since a "lag" prevails between any two of the cross-cultural systems described above. For instance, certain historians of myth and religion consider that such "overlap" is represented by distorted remnants of "primitive" cultures which have endured even in the most "modern" societies (Caillois, 1969; Cassirer, 1946; Huizinga, 1955; Leach, 1961; Paz, 1961). Or it might be that, in line with many mythologists, we are destined to recapitulate time and time again the age-old rituals of antiquity, and thus there is "over-lap" between all cutures (Campbell, 1956, 1968; Eliade, 1967; Frazer, 1959).

(c) STRONG INTRACULTURAL SYSTEMS. A form of incommensurability exists between world-views within the same broad-based cultural system. This is much like the Whorfian (1956) hypothesis according to which a particular language creates a distinct world-view in the minds of the members of a particular speech community. Similarly, in Western-World science, Kuhn's "paradigms," Feyerabend's "theories," or Foucault's (1971) "epistemes" constitute radically distinct ways of perceiving the world. Ideally, according to this view, the Newtonian physicist cannot totally communicate his scientific views with the young contemporary physicist. And the fundamentalist Baptist cannot communicate effectively with the Catholic when they discuss religion.

However, it must be conceded that there also exists a degree of "overlap" between all languages and all world-views which are generated from within a broad cultural background. This "overlap" allows for at least a degree of communication. All Christians within the Western-World tradition share a certain number of conventions which appear to be incommensurable with non-Christian religions. And contemporary Western-World scientists from different "paradigms" share at least a few basic assumptions which remain outside non-Western scientific cosmologies. This degree of "overlap" between intracultural world-views is primarily due to "semantic lag."

(d) WEAK INTRACULTURAL SYSTEMS. At the weakest extreme partial incommensurability can exist between schools, generations, or movements in the arts, or between distinct philosophical, ideological, etc. views within similar (sub)cultures. These distinct perspectives might also, with varying degrees of effectiveness, be interpreted as broad-based "paradigms" (see Laszlo, 1972; also, the provocative studies by Goldmann, 1955, 1964).

This typology is at most suggestive and exceedingly rough. I certainly do not intend for it to be a finished product, only a guide toward possible research that may substantiate (or refute) the general theory I am constructing. The contemporary Russian semioticians, following Lotman, have produced ground-breaking studies on the general semiotics of culture. I believe that future inquiry along these lines can determine whether or not a typology such as I have presented here is feasible.

APPENDIX II

Metaphor and Metonymy

Consider the notion that metonymization and metaphorization can be described formally by an abstract calculus of *sets* and *classes* (see also Tversky, 1977).

A set is a well-defined collection of entities which can be numbers, people, letters, words, cities, etc. Each entity in a set is called an "element" or "member" of that set. A "set of sets" such as the set of all birds can be termed for convenience a "class of sets." The entities and sets composing a class have certain common properties; for instance, the class of all men, the class of all dogs, the class of all cars, etc. A system of classes consists of the inclusion of classes under each other (i.e., German shepherds $<$ canine $<$ mammals $<$ vertebrates $<$ animals). Such a system allows for relations of similarity (metaphor) between elements from one class of things to another class of things in a parallel system, or for relations of contiguity (metonymy) between elements along the sequential chain within one system. The task is now to describe these complementary metaphorical and metonymical processes.

Metaphorization

A is metaphorical with respect to B if the following specifying conditions are fulfilled.[1]

(a) There exists a set, S, containing two subsets, A and B. Let A and B be called, in the terms of Black (1962), the "principle subject" and the "subsidiary subject" respectively. Let A and B include a number of "elements" which consists of the total number of "attributes" possessed by A and B from within a given perspectival framework. Let the number of elements, in light of the fact that the actual and potential number of possible perspectives over an unlimited period of time is indeterminate, be equally indeterminate and unlimited. Hence, let the total possible number of elements over time in A and B be defined as "everything potentially sayable about A and B": the sum of all their possible attributes.

For example, consider the statement, "The lion is roaring," where "lion" is the subsidiary subject and a particular "man" is the principle subject. An analogy exists between, from within a given perspective, some particular attribute possessed by "that man" (the principle subject) and some particular attribute possessed by a "lion"; that is, by the "class of all lions" (the subsidiary subject). The choice for this analogy is determined "pragmatically" and depends upon a particular perspective derived from social conventions and knowledge of culture-world. In other words, what is necessary for metaphorization in this case does not depend solely on whether the speaker and the listener know the dictionary meanings for "lions" and "men." It is necessary that they share a "system of associated commonplaces," a set of "culturally shared experiences" (Black, 1962; Hesse, 1966). Such extra-dictionary knowledge includes culture-bound notions that lions are easily angered, noble, brave, "kings" of all beasts, gorge themselves excessively on raw meat, etc. This is *encyclopedic knowledge.* A speaker, when using words in such a way that encyclopedic knowledge concerning that term is necessary for comprehension of the utterance, ordinarily presupposes that the listener possesses such knowledge. Metaphorization therefore implies "that in any given culture the responses made by different persons . . . would agree rather closely and . . . even the occasional expert, who might have unusual knowledge of the subject, would still know 'what the man in the street thinks about the matter.' From the expert's standpoint, the system of commonplaces may include half-truths or downright mistakes (as when a whale is classified as a fish); but the important thing for the metaphor's effectiveness is not that the commonplaces shall be true, but that they should be readily and freely evoked" (Black, 1962). In this way a speaker expects the listener to interpret the utterance in such a way that the potential metaphorical relationship emerges; the utterance possesses built-in "pragmatic" presuppositions.

More explicitly, the above metaphorical proposition could read:

"All lions roar.

That man roars.

Therefore that man is (figuratively) a lion."

All this is not necessary, however, since the pseudo-logico sequence contained in the syllogism is implied by the metaphorical relation (compare to the implied self-referential characteristic of SS-systems in 2.22).

(b) IDENTITY ELEMENTS. There exists at least one, but usually more than one, element (that is, "attribute"), x, which belongs to subset A and also to subset B. That particular "man" who is metapborically related to "all lions" possesses some attribute(s) which are identical to certain attributes possessed by "all lions" but which do(es) not satisfy the conditions for metaphorization. That is, "that man" and "all lions" are physical objects,

animate, mammals, etc. These attributes proceed from general to particular categories, and they express semantic properties equivalent to the Katz-Fodor semantic markers (cf. 1.3).

(c) OPPOSITIONAL ELEMENTS. There exists at least one, but usually more than one, element ("attribute"), y, which belongs to A but does not belong to B, and there exists at least one, but usually more than one, element ("attribute") z, belonging to B which does not belong to A. Hence elements y of A are incompatible with elements z of B. Given the incompatibility between these opposite elements in A and B, A cannot be a subset of B nor B a subset of A. Elements y and z constitute "binary oppositions" of a particular nature: [i.e., MAN/LION → biped/quadriped, herbivarious + carnivorous/carnivorous, human/nonhuman, etc.]. Such elements are also equivalent to the Katz-Fodor markers. The prevalence of oppositional particularistic elements possessed by "that man" and "all lions" produces two groups of "logically" incompatible elements. Hence not every man can be identical with or equivalent to "all lions." He must in this case be a particular type of "man" whose particular capacity makes him a candidate for metaphorization with respect to "all lions." Moreover, the OPPOSITIONAL ELEMENTS possessed by "that man" and "all lions" are so related to one another that their intersection produces no "overlap," they are disjoint. Hence no metaphorically valued space exists between them [i.e., biped ∩ quadriped, etc. = ϕ (the null or empty class)]. OPPOSITIONAL ELEMENTS are neutral with respect to the necessary conditions for metaphorical similarity. But they are at the same time prerequisites for metaphorization since one-to-one oppositions must exist in order for it to be possible to create lines of similarity or "overlap" between A and B. That is, without OPPOSITIONAL ELEMENTS there would be total identity between A and B.

(d) SIMILARITY ELEMENT(S). There exists at least one, and from a particular metaphorical perspective usually only one, element ("attribute"), g, called the similarity element. g exists in both A and B, but it is not identical to any x in A or B, to any y in A, or to any z in B.

Assume that the chosen element, g, in the above example is "roar."[2] This element is in whole or in part the product of culture-bound, *Weltanschauung*-bound, and language-bound values. In a culture where "roaring" men are normal this element would generally not be chosen for metaphorization. In contrast, in a culture where a man who "roars" is "despicable," it can be chosen for a metaphor with derogatory connotations. And so on. In this sense, g is always "freely created," but with the restriction that it must fall within a set of commonplace associations and collectively shared experiences to be intelligible. If unintelligible it might not be perceived as metaphor.

It might be classified as meaningless, nonsensical, or perhaps the product of insanity. However, of course, as outlined above, what for one culture and period in time is metaphor, for another may be "reality," and for still another may be insanity. Hence the element *g* can drift in and out of the categories of all culture-bound, *Weltanschauung*-bound, and language-bound CFs (see Levin, 1977, for a theoretical discussion of diverse readings of metaphors from a linguistic viewpoint).

(e) For the condition of metaphorization on *g* there exists a set which contains exactly that element *g* which fulfills this condition. With respect to the "lion-man" example, *A* and *B* contain *g* (or "roar"), which fills this condition.

"That man" and "all lions" are metaphorically qualifiable by "roar" and hence both satisfy the conditions necessary for "all things that roar"; that is, "possession of the capacity to roar." Specifically, "roar" is natural for "all lions" and presumably, from within a given metaphorical perspective, non-natural for "all men." But "that man" possesses this special attribute ("element") which qualifies him for metaphorical relations with "all lions." Hence, "roar" with respect to "that man" is metaphorically charged such that it fulfills the necessary conditions for metaphorization.

But that is not all. There exist "free variables" potentially common both to "that man" and to "all lions." These variables might include such presupposed items of encyclopedic knowledge as: "easily angered," "impudent," "has halitosis," "backs up his roar," "is the 'king,'" etc. Merely to compare "lion" to "man" is an oversimplification of the metaphorical process. Metaphor is more than mere analogy or similarity; it presupposes encyclopedic knowledge of all (sub)sets involved, and those (sub)sets interact to produce a new meaning which would be unavailable to some presumably neutral perceiver of the (sub)sets in isolation (see Black, 1962).

(f) The (fictional) union of *A* and *B* constitutes a *particular metaphorical universe of discourse,* an SS-system entity. If the similarity element *g* does not exist (or is not chosen) in *A* and *B*, the intersect of *A* and *B* from that non-metaphorical perspective consists exclusively of IDENTITY ELEMENTS.

Metonymization

An element *m* (which is part of or contiguous with another entity) relates metonymically to an entity *A* if the following specifying conditions are fulfilled.[3]

(a) MEMBERSHIP ELEMENT. There exists a set *A*, the "principle subject," and there exists an element *m*, the "subsidiary subject," which

is a member of *A*. Unlike metaphor, the "principle subject" in metonymy is a whole image which is related to the "subsidiary subject" in terms of part-whole, contained-container, cause-effect relations, or relations of contiguity. In other words, the "principle subject" consists of a set of elements (parts) one or more of which constitutes the "subsidiary subject," or the "subsidiary subject" might consist of an element contiguously related to another element both of which comprise the "principle subject."

For example, consider the statement: "He has a hot set of wheels." Cognizance of the metonymical equivalence between "wheels" and "car" involves the cultural modality in which the image of "car" stands: that is, the car and all other images with which it is contiguous (speed, power, dominance, *machismo*, etc.). Metonymical *choice,* like metaphorical *choice,* is contingent upon culturally inculcated conventions and commonplace associations, but always with the inclusion of a greater or lesser number of unknown variables. The function of context and cultural modality in metonymization differs from that of metaphorization. Contextual reasons for metaphorization are prerequisite, but the conditions for the similarity function are self-sufficient and exist within the metaphorical entities *A* and *B*. Awareness of the metonymical function depends upon context as well as upon a larger degree of knowledge of culture-world than metaphorical awareness. For example, "bomb" for "fast car" can generally be adequately comprehended by extrapolated use of dictionary definitions to constitute part of knowledge of culture-world. Bombs are fast and explosive. On the other hand, "hot wheels" for "car" demands more extensive knowledge of encyclopedia. The dictionary does not specify that wheels are hot, that temperature is in any form related to wheels, that the wheels on a car necessarily make it go fast, or that wheels symbolize power and *machismo.* These figurative attributes of wheels, presupposed by the context of the utterance, are certainly absent from any Katz-Fodor taxonomy of the word.

(b) EQUIVALENCE. *m* is (literally) a member of *A* and *A* is (metonymically) a member of *m.* "Wheels" are part of the "car," "sails" are part of a "ship," "cup" is part of a "cup + coffee," "smoke" is part of "smoke + fire," etc. Metonymization demands that attention rest on a particular part (member) while at the same time it is used for the whole image. Hence the subsidiary image is that of the part while the principle image is the whole, and the part is perceived metonymically as being equivalent to the whole.

(c) *A* conjoined metonymically with *m* produces a *particular metonymical universe of discourse,* an SS-entity which necessarily includes its context, a *conditio sine qua non* for metonymization. If the element *m* exists in simple relationship of contiguity with all other elements in *A* without there being an overriding image combining *m* and *A* into an SS-system entity, then *m* is

not a figurative metonymical entity; its relation to all other elements in *A* is that of linear DIFFERENTIATION.

Metaphorization and metonymization require a finite set of *structural variables* (which determines the *order of parts*). With respect to metaphor, structural variables entail all IDENTICAL and OPPOSITIONAL ELEMENTS, and with respect to metonymy they entail distinctions between elements in the hierarchically ordered set. Order of parts presupposes the organization of dictionary definitions into categories marked by + or – to illustrate the presence of or the absence of (i.e., ± biped, ± quadriped, ± mammal, ± carivorous, etc.). Categorized by means of dictionary definitions, order of parts is properly included within the Katz-Fodor model.

Metaphorization and metonymization also require a finite set of *functional variables* (which determines the *order of processes*). Functional variables are responsible for the signifying function of the SIMILARITY ELEMENTS linking metaphorical entities, and they are responsible for the signifying function of the *m* elements which represent whole metonymical entities. The order of processes presupposes encyclopedic knowledge concerning the system of associated commonplaces shared by speakers and listeners. These commonplaces refer to the set of attributes ("elements") possessed by the entity being metaphorized or metonymized, but which would ordinarily apply to the entity with which it is being metaphorically or metonymically related.

Metaphorization (and by extension metonymization) conceived here is not what Black (1962) calls the traditional "substitution" view of metaphor wherein a metaphorical term is used *in place of* the equivalent literal term, nor is it the "comparison" view based on simple *analogy* or *similarity*. I follow quite closely Black's "interaction" view wherein two elements are juxtaposed in an unorthodox way to suggest a *new meaning* not ordinarily possible if those two elements were preceived as a pair of isolated "atoms."

Four key points delimit the definition of metaphor and metonymy put forth in this study:

(a) A theory of metaphorical and metonymical meaning based solely on dictionary definitions cannot account for SS-system change and change with respect to CFs. When considering associated commonplaces and culturally shared experiences, on the other hand, it is possible to explore the entire network in which the *semionic* and *symbolic* entities stand. In this way the SS-system is extended and the *semionic* and *symbolic* entities "interact" potentially to bring about intra-CF or inter-CF "switches." Hence, new meanings arise from the unorthodox combinations of entities.

(b) There must be proper *awareness* on the part of the perceiver *of the*

figurative implication of metaphor and metonymy. In the two utterances:

(1) He jumped up and split his head.

(2) He jumped up and split for the head.

"split" and "head" take on distinct meanings by virtue of a minimal change of the sentential context. But that sentential context presupposes totally distinct frames. (1) is to be interpreted literally while (2) is a figurative utterance: the frames change. To take (2) literally is to introduce nonsense or absurdity. A necessary change of frames in order successfully to interpret the utterance is similar to an ambiguous utterance which is nonsensical or even paradoxical. Its interpretation depends on knowledge of both frames and a consequent digital "leap" from one to the other. A listener interprets the utterance either one way or the other but not both; or, if he is aware of both possibilities he can oscillate between them but he cannot be "inside" both interpretations simultaneously (see van Steenburg, 1965).[4]

(c) Metaphors and metonyms are not mere linguistic associations or decorative and trivial literary devices. They are essentially *cognitive rather than affective or emotive in their meaning.* Hence they are placed on epistemological grounds, the product of "logical conflict" (Beardsley, 1958; Leatherdale, 1974; Berggren, 1962/63; MacCormac, 1975).

(d) Metaphorical-metonymical systems are used in all figurative propositions and utterances. This includes, in light of the definitions leading up to PROPOSITION II: (1) *semionic* statements the figurative aspects of which the writer or reader is conscious and which he can adequately explain, (2) *semionic* statements the figurative aspects of which are culturally embedded such that the writer or reader is not aware that he should be using and perceiving those statements figuratively, but when he becomes aware of the fact, he can adequately explain them, (3) *symbolic* statements the figurative aspects of which the writer or reader is aware, but the statements are enshrounded in mystery or anomaly such that he cannot adequately explain them, and (4) embedded *symbolic* statements the figurative aspects of which the writer or reader is not aware, and on becoming aware he is still incapable adequately of explaining them.

Notes

1. Admittedly, metonymy is often considered to be another form of metpahor. For reasons that by now should be obvious I make a distinction between them.

2. Choice is a key term in the present formulation of metaphorization-metonymization. The possibility of choice also lies at the foundation of set theory. This is called the "axiom of choice." It can be stated as follows: There exists a choice function for any non-empty set. For example, in line with the present discussion, a non-empty set S contains two subsets, A and B, such that their intersection includes an element g which is chosen to satisfy the conditions of metaphorization. For the set of all shoes there exists an ordered pair of elements, right and left. We ordinarily need no axiom of choice for this set since discernment of the right shoe from the left shoe is part of our embedded cultural acitvity, of our form of life. Hence it appears that we know how to choose without needing an axiom in this case. But are right and left shoes, or right and left anything, not part of our "natural symbols," as discussed in Appendix I? If so, then is this choice in and of itself not a sort of "axiom" imposed on us by virtue of our physiological structure? For the Flatlander who sees everything along a plane, shoes do not come in pairs; hence he needs an axiom of choice in order to differentiate between two shoes. Or consider the Martian with three identical feet and each foot with six identical toes. If he wants a special shoe for each foot he needs an axiom of choice properly to order his set of footwear. Choices which are "commonsensical" are either biologically or culturally embedded. They are either "inherited" or they are culture-bound, *Weltanschauung*-bound, and language-bound. A major or minor step outside the circle of ordinary conventions involves choice, from within the "meta-paradigmatic frame" (MPF). This constitutes a sort of "axiom of choice" from that potentially infinite "set of all sets" which is not yet ordered, classified, taxonomized.
3. It has certainly been observed by now that I maintain no categorical distinction between metonym and synecdoche. I have placed part-whole, container-contained, and cause-effect relations with all other relations of contiguity since they relate to the series inside a system without there necessarily being any established relations between one system and another. Relations between systems pertains to metaphorization.
4. Compare the use of "frames" (and also "expectations," "commonplace associations," and "culture-world knowledge") in this study to Minsky (1977):

   > When one encounters a new situation (or makes a substantial change in one's view of a problem), one selects from memory a structure called a *frame*. This is a remembered framework to be adapted to fit reality by changing details as necessary.
   >
   > A *frame* is a data-structure for representing a stereotyped situation like being in a certain kind of living room or going to a child's birthday party. Attached to each frame are several kinds of information. Some of this information is about how to use the frame. Some is about what one can expect to happen next. Some is about what to do if these expectations are not confirmed.

APPENDIX III

Catastrophe Theory

The models proposed in this study can conceivably be explainable by "catastrope theory" (developed by Thom, 1975a, 1975b; see also Woodcock & Davis, 1978; Zeeman, 1976). Catastrophe theory will undoubtedly be important to future studies in semiotics (Sebeok, 1976). This theory consists of an unorthodox topological model applicable to discontinuous and divergent phenomena common to the biological and human sciences. Orthodox quantitative mathematical models are capable of explaining only smooth and continuous phenomena. Catastrophe theory on the other hand deals with that point along a continuum where equilibrium breaks down and subsequently there is a radical shift in the qualitative aspect of the phenomena.

Thom (1975a) claims that there are only seven basic catastrophes. The beauty of catastrophes is that, unlike most mathematical models used in the physical sciences, they lend themselves to visualizable schemes – a boon to the human scientist unfamiliar with abstractions. The proof of catastrophe theory " is a difficult one, but the results of the proof are relatively easy to comprehend. The elementary catastrophes themselves can be understood and applied to problems in the sciences without reference to the proof" (Zeeman, 1976, 65).

To illustrate the model a horizontal plane called the *control surface* is constructed. Two *control factors*, in this case *parallel processes* (metaphorization) and *sequential processes* (metonymization), are projected onto the surface. *Conceptualization* is measured on a third axis perpendicular to the first two. The inersection between parallel, sequential, and conceptualization is the *neutral point,* where we can suppose that the "meta-paradigmatic framework" exists. Moving along the parallel axis increases the possibility of perceiving textual "para-realities" or of enacting a *Gestalt* "switch" from one conceptual framework to another is enhanced. The sequential axis proceeds toward a state of increasing organizational complexity within one textual perspective or within one conceptual framework. The range of modes of conceptualization from parallel to sequential does not re-

present a smooth continuum, as might be expected. A new "topological" surface is required, the "conceptual surface," which is represented by a folded surface above the control surface (see Figure 34). Thom calls this the "cusp catastrophe." The conceptual surface represents the sum of the

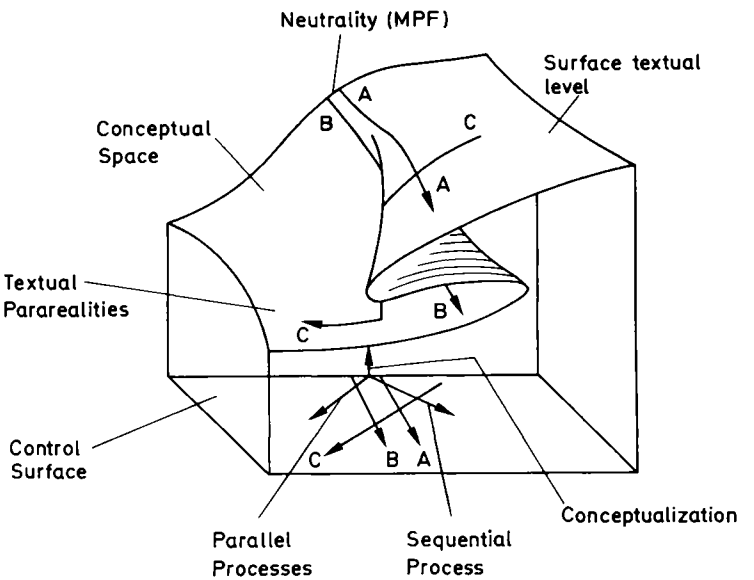


Figure 34

points plotted upward from the control surface. This surface has a slope from "low" values, where the parallel process predominates (the "para-realistic" level of the text) to the "high" values where conceptualization remains principally at the sequential level (the surface-reality of the text). The fold, growing narrower as it approaches the intersection of the three axes, finally disappears.

From near-neutrality of path A the reading flows smoothly along the surface predominated by sequential imagery. Conversely, beginning at B the reader enters gradually into the para-realistic level primarily by means of parallel imagery. However, this idalization is rarely if ever the case. Access to the para-text follows something similar to path C, where sequentiality reaches the fold and then the occurrence of the catastrophe brings about a radical shift in perspective.

There are five basic features of the cusp model. (a) It is *bimodal.* (b) *Sudden changes* are observed in the transition from one level to another.

(c) It manifests the effect referred to above as *hysteresis,* since transition from the top level to the bottom level is at a different point than from bottom to top. (d) The area inside the fold is inaccessible, representing the existence of highly *improbable phenomena.* (e) The model allows for a *high degree of divergence;* similar initial paths can result in distinct final states. In the terminology of the present inquiry, these five features correspond to, (a) parallel-sequential processes, (b) SSS "switches," (c) "semantic lag," (d) inexplainable aspects of all SSSs and TSs, and (e) infinite variability over time, all of which, very significatly, are central to the text theory herein constructed.

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