ENLIGHTENMENT STRATEGIES

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ABSTRACT

Few schemes are more fundamental in life than strategies for enlightenment. Given great differences among cultural groups in beliefs, and noting the continuing presence of major conflicts in most walks of life, one may suppose that enlightenment strategies have somehow been submerged beneath political establishments, to the extent that they have been lost from view. A review of the various enlightenment strategies might be in order that would return them to the surface, giving them renewed visibility. It might also be helpful to see them in the same ambience, should there be those who have become advocates of some strategy without consideration of others. In reviewing these strategies, a comparison of the options available to the learner to highlight strengths and weaknesses may be timely. Such a comparison would seem to be particularly relevant to systems thinking, which often seems to lack presence when and where conflicts abound.

Axiomatic origins from Kant and Peirce are taken as a beginning point. Distinctions are made among six strategies, pinpointed for reference by identifying them with particular exponents: Comte's positivism, Le Moigne's constructivism, Rabinow's "return to founders", Rabinow's "absorb and surpass", von Glasersfeld's "radical constructivism" and Foucalt's "coherent inquiry". The shortcomings of each are described. Finally Foucault's thought is connected to a domain described as structural modeling, which is asserted to be the pinnacle of enlightenment strategies to produce high-quality structural hypotheses for resolving problematic situations.

INTRODUCTION: AXIOMATIC ORIGINS

At some point in the evolution of man, one would suppose that stabilization of learning processes would have occurred, based on efficacy. Such stabilization would be remarked by observing that learning processes are carried out by recourse to a small set of enlightenment strategies, well-studied, well-defined, and well-matched to learning situations and to the learning individual. Such a prospective time might be called the Mature Era.

The working hypothesis is that this Era has not been reached, and that two steps on the way to that era are (a) to define a set of enlightenment strategies tailored to the relatively well-educated individual, the “wei”; and (b) to highlight the strengths and weaknesses of the members of the set of those individuals represented by WEI.

A review of the various enlightenment strategies targeted specifically to WEI might be in order. Such a review would resurface old strategies and place them in the same context with newer strategies. By seeing the various strategies in the same context, a comparison of the options available to the learner to highlight strengths and weaknesses may be timely. Such a comparison would seem to be particularly relevant to systems thinking, which often seems to lack presence when and where conflicts abound.

The choice of WEI as a target group for exploring learning strategies may require no justification, since other groups would not be in a position to learn or assess readily such strategies. Still, if necessary, this choice can be justified partly on the grounds that a substantial amount of study has been given to the youngest among us by Piaget, who presented enough evidence to enable strategies for learning among that part of the population to be studied further and tested in various settings. Further justification can be given by noting that the major conflicts of the world arise in the adult population, where one finds WEI ensconced.

The WEI own sufficient language skills to be able to read and absorb an enlightenment strategy, once defined. Some members of WEI have experienced the effects of the application of varied enlightenment strategies in previous learning environments. The WEI are sufficiently aware of what is going on in the world to be able to detect flaws in what has been learned before. The views of the WEI may have not hardened to the point of being unwilling to examine and assess well-articulated enlightenment strategies. While some individuals in WEI lack an interest in

history, by and large the members of WEI may have no antipathy to learning from historical figures.

In a WEI environment, it may prove to be worthwhile to integrate and make acceptable for application a variety of perspectives to form strategies that are relevant to the major issues of modern times.

In seeking axiomatic origins from which enlightenment strategies may be chosen, integrated concepts from two scholars whose works have stood the test of time have been chosen: Immanuel Kant (1724-1804) and Charles Sanders Peirce (1839-1914).

AUTHORITY VERSUS SCIENCE

For many, perhaps most, of the major conflicts of today and of yesteryear it is possible to identify clearly an authority figure (or a small group centered around such a figure) who compels a certain belief structure that lacks a scientific foundation. To place this remark in a context, and to suspend briefly any prejudicial view of which type of belief is most valuable, one may turn to the writings of Charles Sanders Peirce (CSP), whose 1867 paper titled "How Belief is Fixed" has been reprinted in many anthologies.

In his seemingly unchallenged paper, CSP proposed that there are four ways to fix belief. (Certainly any strategy for enlightenment will closely relate to how belief is fixed.) Here are the four CSP categories:

- **Authority**...where belief is fixed because an authority figure says that something is so, and that is the strategy for enlightening the learner
- **Tenacity**...where belief, once gained, is thereafter hardened and will not be changed
- **A Priori (Metaphysics)**...where belief is gained by reasoned argument, but without experimental evidence, and without giving any attention to providing experimental evidence, although necessarily "linguistic evidence" of historical nature must be summoned for, without that base, a reasoned argument would appear baseless
- **Science**...where all belief is tentative, and is comprised of a mix of explanatory theory

derived from deductive reasoning, and empirical testing yielding inductive evidence that supports the reasoned theory...and where the belief is constantly being tested in order to continue its status as scientific belief. For this testing to occur, necessarily there must be open and effective communication channels, and for these to be effective there must be linguistic quality control for which CSP insisted that there must be a "community of scholars" who assume collective responsibility.

The philosophy of Immanuel Kant (IK) displayed a distinction between what he called "the realm of human obedience" and "the realm of the use of reason". Since CSP was a scholar of (IK), as well as of many other philosophers, it is safe to assume that CSP's concept of Authority and Metaphysics are similar to the two IK perspectives. Following up on CSP and IK, two criteria for human enlightenment can be set forth as scholarly origins in the study of enlightenment strategies.

SCHOLARLY ORIGINS

Kant saw as necessary for enlightenment that the human being "escape from his self-imposed tutelage". In order to do this, the human being would consciously, hence necessarily, choose to expand on the portion of learning activity devoted to reason, as opposed to the portion devoted to acceptance of authority.

Kant's Escape Condition #1. Distinguishing the Realm of Obedience from the Realm of Reason. *The realm of human obedience and the realm of the use of reason must be clearly distinguished from each other.*

Just what is meant by the "realm of human obedience"? Clearly what is being discussed is a willingness to bow to authority. When should the human being bow to authority? When should the human being expect to understand the use of reason? Apparently the latter should dominate the former, in the sense that criteria must be available for choosing to bow or not to bow to authority. IK provided a criterion:

According to IK, after an issue has been settled publicly, obedience should be anticipated

privately.

Kant's Escape Condition #2. Public and Private Use. *Reason must be free in its public use and submissive in its private use.*

Kant has set forth two conditions that are at the root of democratic institutions. These appear clearly to be tied to CSP's ways for fixing belief.

We choose to take CSP's ways for fixing belief and IK's two "escape conditions" as scholarly foundations for recognizing enlightenment strategies for consideration. Application of these foundations may rule out some political strategies for which the two "Escape Conditions" are precluded through force by the political systems within which the WEI actors are ensconced.

Summary Prerequisites for Enlightenment Strategies. In summary, the scholarly origins for advancing the enlightenment strategies to appear in this paper are in CSP's ways of fixing belief and IK's conditions for escaping "self-imposed tutelage".

RABINOW STRATEGIES

Stimulated by collegial interactions with Michel Foucault (1926-1984), the anthropologist Paul Rabinow (ca 1945-....) articulated two more recent enlightenment strategies which he perceived as active in the evolution of what is referred to in higher education as "knowledge".

These may be named, respectively, as "Absorb and Surpass" and "Return to Founders".

Rabinow Strategy #1. Absorb and Surpass. As Rabinow perceived the evolutionary development in higher education circles of the biological and physical sciences, *"the original texts...are fully absorbed and surpassed by the scientific work that follows them...".*

This *Absorb and Surpass* strategy is characterized by building vertically, i.e., hierarchically, i.e., inclusively, in the sense that older findings become incorporated in, amended by, and enlarged through newer findings. While not explicitly stated in Rabinow's *Absorb and Surpass* strategy,

one must note that new findings tend to imply or even force linguistic revisions. New findings normally involve linguistic invention, and sound linguistic invention involves discursive revision. Subtle linguistic revisions may also incorporate subtle amendments to understanding. This is readily illustrated in the renaming of such gaseous elements as what we now call oxygen and nitrogen from their first recognition until the present time.

Rabinow Strategy #2. Return to Founders. Again, as Rabinow has described matters, *"in the human sciences...one finds a constant return to the texts of certain 'founders of discursivity', despite advances in factual content, verification of hypotheses, and method."*

It must be made clear that the two Rabinow strategies are fundamentally different. In contemporary scientific matters, it seems that biological and physical scientists and engineers generally distinguish implicitly, i.e., by their behavior, the realm of human obedience from the realm of the use of reason. Obedience is seen in the widespread and pragmatically-conditioned acceptance of what are called "laws" of physical science and biology, applying them repeatedly in practical settings around the world. The *Absorb and Surpass* strategy is clearly at work in these fields, as Rabinow indicates, and as can be readily seen by comparing textbooks across decades.

It is reasonably easy to support an argument that the many achievements in these fields would have been impossible had not the *Absorb and Surpass* strategy been an integral part of the evolution of these fields.

While there must be some linguistic evolution associated with the Return to Founders strategy, major linguistic evolution does not distinguish this second of Rabinow's strategies. On the contrary, if Return to Founders means much, it must mean preservation of linguistics, if not entirely, at least significantly. Further, in the sense that the *Return to Founders* strategy has not been a significant part of the strategy of biology and physical sciences, one may note that the linguistics of these fields undergo major transformations over time, so that while these founders retain honorable positions at the base of these fields, it is seldom found advisable to refer to their work in modern teachings, except as entrees into newer developments; i.e., as a way of demonstrating the *Absorb and Surpass* necessities to gain enlightenment for modern life.

FOUCAULT'S COHERENT INQUIRY STRATEGY

Perhaps to avoid the baggage that seems implicitly to have been attached to (or more precisely, substituted for) the processes of "science" in these times, Foucault speaks of "coherence in the labor of diverse inquiries".

Foucault's Coherent Inquiry Strategy. *The Foucault Coherent Inquiry (FCI) Strategy notes that enlightenment is best gained when there is coherence among these three factors of inquiry:*

- ***Theoretical****...in which there is set forth what CSP would describe as a reasoned argument, based in some arbitrary assumptions (call them axioms, postulates, guesses), followed by some deducible consequences that may extend forward at quite some length*

- ***Methodological****...in which some process designs are constructed that can be applied to test whether the consequences arising from the Theoretical actually turn out to occur*

- ***Practical****...in which the processes are applied, the consequences are observed, and are compared with what the product of the Theoretical asserted would occur*

If there is some coherence among these three factors of inquiry, then one can say that the *FCI Strategy* has produced some enlightenment; but even if there is little or no coherence, one can still say that some enlightenment has occurred, to the extent that what was initially thought to be true turned out not to be true; possibly providing some incentive to formulate a new theoretical construct.

The FCI Strategy is very similar to what long ago was called "the scientific method". It does not match perfectly CSP's description, because he calls for a "community of scholars" that constantly tests any given result, modifying if necessary or tossing the hypotheses out altogether if results prove to be unacceptable in terms of evidence found.

The human sciences tend to become heavily involved in the practical component of the *FCI Strategy*, perhaps without attention to the other two components. Consequences of failed theories or practice may exhibit short-term effects that draw immediate attention, typically in one

of two ways: (a) modification of profitability of enterprises or (b) changes in health of human beings. Not only are there short-term consequences, but these consequences can typically be attributed to specific causes, at least in many products. For example, the presence of lead in children's toys not only fails to go unnoticed, but causes a major upheaval in the marketplace for Christmas, as well as reverberations in international relations. The situation is a bit more murky in the biological area, but in that area there is less willingness to experiment without formal discussion of the theoretical and methodological, and since causation may be murky, caution may prevail.

In the human sciences, there is one factor that is dramatically different. That factor is the large number of variables involved in many or even, perhaps, in most situations.

The human sciences seldom demarcate clearly any realm of human obedience to laws that is comparable to that applied in the other realm. Instead, there is often an emotional component stirred in with discussions of whatever scientific results may be present. In any effort to arrive at such a demarcation, one finds the early work of Claude Henri de Rouvroy, comte de Saint-Simon [Henri Saint-Simon, (1760-1825)], and more especially of his student, Auguste Comte [1798-1857]. These Frenchmen and their followers conceived sociology and, of direct relevance to modern thinking, positivist philosophy to underlie sociology, which underpins most modern engineering education, business-school education and much of what is taught in schools of public policy. Often the administration and faculty of these schools may be completely unaware of the existence of positivist philosophy and of its origins!

While there were numerous followers of Saint-Simon, Comte is the best known and shares with Saint-Simon the title "founder of sociology". Whether there is widespread recognition of the impact of Comte's long-term strategy is not clear, but there is an indication that it has had major impact in higher education.

COMTE'S POSITIVIST (LONG-TERM) STRATEGY

Comte's strategy is of interest because it initiated several other strategies to follow, and because its third component is still active strongly today in certain components of higher education.

Comte saw enlightenment developing in three long-term stages, which make up his *Positivist Strategy*:

- **Stage 1: Theological**...in which authority was the dominant mode of learning, coming from religious leaders
- **Stage 2: Metaphysical**...in which learning came from theoretical musings and arguments founded in assumptions with deductions from the assumptions, but no empirical support
- **Stage 3: Positive**...in which the quantitative and mathematical concepts from statistics dominated decision-making, leading to such modern concepts as "plan, do, check, act" and Total Quality Management.

Comte argued that this *Positivist Strategy* would evolve slowly, so that over time learning would evolve into "positivism", and the quantitative would dominate all decisions.

He believed that the science of sociology would evolve apace, and would slowly arise from something like an *Absorb and Surpass* strategy until it encompassed all previous science.

One may note that the political environment in France appears to have been significantly influenced over at least two centuries by the political thought of Henri Saint-Simon, Auguste Comte, and their followers at the Ecole Polytechnique. Professor J. L. LeMoigne has argued that their influence determined the philosophy that underpins engineering education in the USA even today (Le Moigne, 1981), accounting for the very limited attention given in such programs to system design. According to Le Moigne engineering at its origin at the Ecole Polytechnic was faced with a choice between design in the fashion of Da Vinci and analysis in the fashion being promoted by Comte, and it made the positivistic choice which, once embedded, sunk into concrete literally, as in a civil engineering construction.

The true story is told of a group of academics who came to a major automobile company and asked to be taken to the design department to learn the design processes. After they had left a vice president remarked to the effect that the company had no design process. In this respect, it was not alone, for there was a general feeling among the engineering community that design could not be taught. After all, over two centuries without this happening provided evidence of the truth of that idea, did it not? And since gravity had not been discovered for millennia, presumably

gravity did not exist did it?

LE MOIGNE'S CONSTRUCTIVIST STRATEGY

Constructivism is most readily understood when viewed in connection with two other philosophical concepts: solipsism and realism. *Solipsism* is the point of view that accepts only the idea of one individual, who can only know self-existence, and that only because of the ability to think. *Realism* is a point of view that accepts the idea of a real world which exists independent of any observer, which can be explored and about which knowledge can be accumulated over time by appropriate empirical evidence, adequately analyzed and compared. *Constructivism* is the point of view that, while not accepting solipsism (except in what is, unfortunately from a consistent linguistic point of view, called "radical constructivism"), also does not fully accept realism. While different advocates of constructivism may shade the concept in different ways, a modern and distinct articulation of it is that given by Jean Louis Le Moigne (1931-). As he sees it, there is a real world that exists independent of the observer, but the observer is incapable of accurate description of it. Instead, the observer's response is purposeful adaptation to it. This point of view is consistent, in a sense, with what a fellow-Frenchman Michel Foucault has proposed as a view toward proper writing of history, which combines a weak description accompanied by a constructed notion of attributed purpose to the actions that produced the recorded events of history. Constructivists, as far as I know, are mute when it comes to a discussion of the subject of writing history.

Realists reject constructivism, preferring to stay on the side of Newtonian mechanics, and avoiding clear-cut studies of human behavior that account for major mistakes in large system designs.

The constructivist (as opposed to the "radical constructivist") recognizes the singular input channel: While there is no way to be absolutely certain that there is a real world, since everything that the human being experiences is through sensations arising out of experience, and what is conceived is what is constructed by human thought processes, common sense and everyday experience is on the side of the existence of a real world. Too much evidence exists to deny that common sense experience. Moreover this experience supports the concept of purposeful human behavior in adapting to that world, as gained through both local and global cognitive experience.

On the other hand, as Le Moigne has made clear, “intelligent action is based on regularities which the thinking organism abstracts from subjective experience, including his or her construction of others as part of the experiential field, the judgment of viability and the subsequent construction of an experiential reality gain their value and relative permanence on the basis of their intersubjective compatibility.”

This quotation, taken from a festschrift to Le Moigne, clearly links constructivism to realism in a way that is very favorable to constructivism and very unfavorable to advocates of realism, since in its ultimate interpretation, it just says that realists ought to take into account the fact that experimenters, being human, are capable of being fallible, as the best among the world’s philosophers have emphasized (cf. CSP repeatedly, echoed by an appreciative scholar, Popper).

What is the enlightenment strategy that is recommended as a part of constructivism? It is to seek out that learning that reflects a balance between classical science and modern empiricism, reflecting a studied awareness of observer fallibility, and the possibility, now established, of effective, facilitated collective inquiry (see later in this paper).

Von GLASERSFELD’S RADICAL CONSTRUCTIVIST STRATEGY

The rainbow, as is demonstrated by the capacity of the prism to break up light into a spectrum of colors, illustrates that part of physical vibration consists of visible light, represented by the string of letters ROYGBIV. The term “spectrum” has passed into widespread use to represent a sequential diversity of views extending to extremes. In presenting learning strategies, one may demonstrate an openness by suggesting that there is a spectrum of learning strategies extending to extremes. Perhaps at one extreme one finds Ernst Von Glasersfeld’s radical constructivist strategy. To comprehend this strategy, one begins with the notion just discussed, known as constructivism. This concept holds that individuals construct their view of the world, sometimes known as their “world view”, as a processed aggregate of their experience.

But the radical constructivist takes things a step further, and embraces solipsism. Under this condition, there being no external world or, at least, no way of determining that there is, one is faced with an extremely confusing situation. This strategy seems to imply that there is little hope for any form of collaboration, suggesting that the individual should go it alone, but should

recognize that the individuals' concept of the world is unique, and should adjust personal behavior accordingly–though without any guidepost to govern how that behavior is adjusted.

A STRATEGY "MARKETPLACE"

It would be possible to enunciate other strategies, but with those discussed here, it may be possible to discuss the following issue. Supposing that there exists a "strategy marketplace", i.e., that wei's can choose among the strategies mentioned, why might they not choose one or more of the strategies mentioned?

Are there specific shortcomings vis-a-vis these various strategies that mitigate against choosing among them as enlightenment strategies?

If there are, and if these shortcomings can be enunciated, perhaps it will be possible to formulate a description of a strategy that lacks the shortcomings found for these strategies. Or perhaps an active strategy can be set forth that is already in place–one that already is demonstrably better than the ones set forth, at least in some learning situations. *To explore this matter is the principle intent exhibited in the remainder of this article.* The task is then to compare the following strategies:

- (Comte) Positivism
- (Foucault) Coherent Inquiry
- (Le Moigne) Constructivism
- (von Glasersfeld) Radical Constructivism
- (Rabinow) Return to Founders
- (Rabinow) Absorb and Surpass

In doing so, for simplicity, the names of individuals associated with these strategies will be dropped and only the names of the strategies will be retained in assessing and comparing enlightenment strategies.

SOME SHORTCOMINGS OF THE POSITIVIST STRATEGY

The *Positivist Strategy* is based in the assumption that eventually the *Absorb and Surpass Strategy* will apply to all aspects of enlightenment with a very specific consequence (socialism), whereupon human science and, in fact, science itself will be fully integrated. *Absorb and Surpass* implies, as is clearly illustrated over and over in the physical and biological sciences, the discovery of a set of applicable laws from which higher-level concepts are deducible, and which permit a towering structure of inclusion relationships to arise.

Such a structure arises because of locale-independent and situation-independent repetitiveness. But the readily-demonstrated lack of repetitiveness was replaced in thinking about the social situation by the concept of statistical formulations. When statistics take over, repetitiveness in the small is not required at all in order for an overriding argument to prevail; only averages or other statistical factors. The individual human being necessarily becomes lost in the aggregate, much like an individual atom is lost in a gaseous mixture.

The component is lost in the aggregate.

Hayek observed that both communism and fascism drew their inspiration on the European continent from the same intellectual origins, namely the Comteian perspective as set forth in positivism (Hayek,), illustrating how the individual came to be submerged in both fascism and communism.

Kant's Escape Conditions in which an individual becomes more enlightened, rely on reason that is free in public use. But the public becomes ever more aware that governmental statistics are nothing more than a weapon to be used by the powerful against the individual, and to suppress reason. Hence Kant's Escape Condition 2 is violated because reason is not free in public use, and submission becomes subject to unreasoned force. Kant's Escape Condition 1 is violated as well, because statistics submerge any distinction that could be made.

In other words, the positivist strategy is ruled out of consideration altogether in light of the pre-condition set forth at the beginning of this manuscript. Since individual atoms in a gas do not have the power to direct their own movements, and behave only in regard to the statistics of the gas a whole; and since individual behavior is inherent in the Kant conditions, positivism is ruled

out at the beginning. We may drive a few more nails in this strategy before leaving it.

Sir Geoffrey Vickers (1894-1982) sought to draw a distinction of the type being mentioned here in his book titled *Human Systems are Different* after visiting an institution best described as a haven for positivism, which caused Vickers to observe that “In the beginning was the Word...not the equation”.

The physical laws that draw a boundary demarcating where behavior is “obedient” from that where reason is freely exercised are not recognized in the human sciences, any more than that the movement of hurricanes is not predictable.

The positivist Strategy incorporates the assumption that everything can be quantified. It is true, of course, that everything can be quantified. It assumes, secondarily, that the quantification is significant, and can be interpreted in a reasonable way. This secondary assumption is part of the soft sand upon which Comte’s *Positivist Strategy* founders. Robert James Waller expressed it this way: “If it can be quantified, it’s probably not important.”

SOME SHORTCOMINGS OF THE COHERENT INQUIRY (FCI) STRATEGY

Examination of the literature of the human sciences will often reveal that situations with high numbers of variables are treated as though they are situations with low numbers of variables. The split of the human sciences itself implies an artificial fractionation of situations into classes of subsets of variables, which would not be necessary if the human being could absorb the variability of situations. The variety of factors absent in many of the situations encountered in the physical sciences and, perhaps, in the biological sciences, becomes highly problematic in the human sciences. These factors can perhaps be explored singly for their separate affects, but when they are envisaged as being at work collectively, their total impact may not be envisaged through analysis.

Factor 1. Thinking in Sets. Certain authors clearly think in sets. One of these was Michel Foucault. To observe this, get one of his books, and start through the text marking those passages where he lists several factors that are at work in a text situation. You will find that he does this repeatedly, indicating that it is his practice invariably when confronted with a text

situation where an explanation is required, or where a decision is to be made, to begin to envisage the factors that are involved in that situation. You may find it interesting to do the same with one of the books by Friedrich Hayek (1899-1992), another author who tended to think in sets.

How do these authors determine the number of factors that are relevant in each situation? If you develop a sensitivity to the practice of thinking in sets, you may observe that very few authors appear to follow that practice in their text. Or, to put it another way, most authors think in sets with one member. Thinking in terms of sets with one member could be described as "opinionated thinking".

But even to think in sets of 3 or 4 could be opinionated thinking to a lesser degree! If causality is to be asserted, necessarily at the root of such an assertion there is some "stopping rule" to know how to determine when to cease listing relevant factors. In order to do this, one must know a great deal about the situation; but if you believe the *FCI Strategy*, you will not know the size of the list this until you have completed the practical part of the strategy. Evidently a core ingredient of the teaching of "critical thinking" is to ask the scholar to look first for the practice of thinking in sets, and next for the stopping rule that enabled the author to know the size of the set. *If these two ingredients are absent in the text, one may question the quality of the scholarship, and thereby failure to demonstrate the attainment of the stated goal of a liberal education: to become adept at critical thinking.*

Factor 2. Implied Linear Formulations. Ironically, neither Foucault nor Comte have anything to say that is both comprehensive and precise about how to formulate descriptions. Foucault's writings exhibit spectacular capability with prose. Comte's writings relied on arithmetic and algebraic materials. All of the writings done by both of these writers followed the classical formula which is being applied even in this manuscript, viz: writing from left to right and from top to bottom of the page. Clearly such a mode of writing is nothing more than a concession to the physical attributes of the human being. If the human were shaped like one mile of the autobahn, for example, the writing would probably be presented along the roadway in a one-mile long signpost.

Nonetheless the writings could be so presented because they are fundamentally linear in nature, being wound back and forth only to accommodate the natural travel scope of the human eye, to which the paper and the computer screen have been adapted.

It is a basic assumption in both the *FCI Strategy* and the *positivist strategy* that whatever should be learned, even as societies become more complicated, as technologies become more intricate, as human interactions more elaborate, can always be presented and mastered through linear presentations.

That this is an assumption has almost gone unnoticed. That it is an incorrect assumption also seems to have gone almost unnoticed. *That it is readily proved to be an incorrect assumption is not something that the academic community desires to hear, because the implications are too far-reaching.*

Without going into detail in this manuscript on how easy it is to prove the assumption to be wrong, one may ask that judgment be suspended, and simply say: "suppose it is wrong, what are the implications for learning strategies?"

Evidently the assumption is correct when applied to learn certain materials, otherwise human beings would not have been able to learn much to date. *Hence it must be clear that if the assumption is incorrect, what is to be learned in essence shall be bifurcated into two portions: that which can be learned through linear formulations (Class 1), and that which cannot (Class 2).* This implies that, if the assumption is not correct, *the search for a more general learning strategy should, at least, involve one that will Absorb and Surpass those strategies that imply linear learning.*

Factor 3. Inattention to Ubiquitous Behavioral Learning Pathologies. Any serious student of such matters as interdisciplinary studies, or systems studies, or cross-disciplinary studies, or areas with such terminology cannot help but note that there have been behavioral studies carried out at the most prestigious universities which reveal ubiquitous behavioral learning pathologies, i.e., aspects of virtually all human beings which represent limitations on their learning powers. When proposals for learning strategies are set forth that ignore these limitations, one must (at least initially) look at them with a suspicious eye, wondering if they are not quite Utopian in concept, to be set aside until something arises that reflects the possible.

Rather than repeat what has been amply described in previous writings by the original authors and in my own several books, I will simply mention the names of some of these authors some of whom

will surely be known to the readers, but who may not have been connected to the present context: Chris Argyris, Robert F. Bales, Kenneth Boulding, Anthony Downs, Michel Foucault, George J. Friedman, Irving Janis, Harold D. Lasswell, George A. Miller, Herbert A. Simon, B. W. Tuckman, and Geoffrey Vickers. In addition to this list, there is the empirical work uncovering what has been called "Spreadthink" (Warfield, 1995), which demonstrates that a characteristic of the Class 2 situations is that the views of any two people who come into intimate connection with the situation are likely to be uncorrelated. This result alone fits precisely LeMoigne's view of constructivism in the contexts in which Spreadthink is found empirically. One consequence of this is that a coherent learning strategy must fill in "holes" in the knowledge of each of those people. A second consequence of this is that the filling of those holes involves the study of nonlinear structural relationships among components of the situation. **This requirement adds a new component to all of the learning strategies mentioned in this article.**

In summary, the FCI Strategy has three shortcomings:

- **No Stopping Rule.** It offers no way to determine a stopping rule for saying how many variables are involved in description, analysis, or design; even when it is recognized that there may be many
- **Silence Implies Linear Linguistics.** Linear linguistics are implied by all mentioned modes of description
- **Implicitly Disavowed Known Behavioral Learning Pathologies.** The latter, while not reviled, are simply ignored, even though there is abundant evidence that they are critical to descriptions, analyses, and designs

SOME SHORTCOMINGS OF RADICAL CONSTRUCTIVISM

What an individual knows or believes might be called the cumulative effect of the life trajectory. Since no two people have the same life trajectory, no two people have the same aggregated knowledge. (At the same time, one may observe for later recall that individuals often have correlated components of life trajectories, though this is not part of radical constructivism, which may even deny the possibility of correlation of life trajectories.)

In CSP's view, the scientist engages in a continuing effort to describe a world that is real, never achieving perfection, but approaching, perhaps asymptotically in some instances to the ultimate goal. That real world is available to all scientists, none of whom perceive it in exactly the same way, perhaps because it is undergoing constant change. It was this perception which led CSP to travel to a variety of locations (Europe, included) to swing pendulums, to measure the effect of gravity in order to make precise maps for navigation of ocean-going vessels, reflecting small variations in gravity from one location to another, trusting that gravitational forces would not change so rapidly as to frustrate the use of their effects in navigation.

It is this gradual approach to discovering truth about the physical world that constitutes the work of the physical and biological sciences, and which underpins the *Absorb and Surpass* strategy. While some believe that scientific work advances largely by "breakthroughs", it seems likely that many scientists would dispute this fanciful, but common, point of view.

On the other hand, some of the human part of the world is not accessible and that is the part dealt with very nicely by Sir Geoffrey Vickers in his book "Human Systems are Different", and dealt with in a different way in criticism of Comte by Friedrich Hayek. This part of the world comes and goes and has not yielded to the *Absorb and Surpass* strategy. (Some of it, however, has yielded, but has not yet been widely incorporated into learning strategies.)

The tenets of *Radical Constructivism* deny the existence of a real world, and of the possibility of any two people to gain a highly correlated view of that real world. This perspective is based on the assertion that all the individual has to go on is processed through the individual's perception, and no two individuals share the same perceptive apparatus.

In essence, then, the tenets of *Radical Constructivism* seem to deny the prospect of enlightenment altogether. At the same time, **its proponents seek to enlighten others about that denial**. The pot of gold, if any, is not at that end of the enlightenment rainbow.

In summary, radical constructivism has these shortcomings:

- **Denial of Past Findings (Even Language?).** It denies the findings of millennia of human study

- **No Criterion for Human Decision-Making.** Even if true, it offers no criteria for constructive decision-making behavior on ordinary life
- **Absorptive.** If false, it absorbs the energy and time of intellectually-oriented individuals who might well assist fellow human beings who have real problems and need help with them

SOME SHORTCOMINGS OF CONSTRUCTIVISM

Constructivism, as described by Le Moigne, has made a major advance over classical science, mainly by recognizing that while the individual does construct the world that constitutes the individual's personal world view, that construction is comprised not only of observations of the non-human portion of the world, but also of the interpersonal component and, in that respect, enjoys the benefits of what might be called shared perceptions. In other words, the individual is not alone in the world. This finding immediately brings the individual into the entire realm of scholarship, and leaves the realists "holding the bag" for all findings that are defective because of defective observers. In recent times, this is a very large bag, for sure.

While Le Moigne does not emphasize it, one may note that the individual may not make only interpersonal observations, but may also observe the entire panoply of past observations, as documented in the literature (i.e., may benefit from linguistic legacy, which the radical constructivist readily applies, yet denies), hence may convert what some would say is authority into scientific observation. This non-trivial result expands greatly the scope of scientific observation, for all of science relies on what CSP calls a "community of scholars" and nothing is said about the requirement that this community be limited to any particular time span.

Hence, while it might appear at first glance that there is a conflict between constructivism and the axioms set forth earlier in this manuscript, one must not jump to this conclusion for reasons just given.

Shortcomings in enlightenment strategies are those of commission and those of omission. Those of commission are basically those that are erroneous in their constructions. Those that are of omission are those which, if appropriately integrated, would bring the strategy closer to perfection.

Constructivism suffers from shortcomings of omission.

Linguistic Adjustment. To perfect constructivism, it would be necessary to recognize linguistic aspects. It is remarkable that linguistic issues do not seem to arise in discussing constructivism. Perhaps it is best in assessing the relative merits of realism and constructivism to note that there seems to be **an assumption that even if inquirers have exactly the same language, they cannot construct the same descriptions of the same stimuli;** or that they would even experience the same stimuli. This assumption is belied by such ordinary day-to-day events as grocery shopping, where many individuals shop for eggs and all come away with the same type of products. This does not mean, of course, that each individual acting alone produced the description of the object. What it does mean, and this is the critical distinction in terms of enlightenment, is that constructivism cannot deny the possibility that individuals will be able through learned experience to absorb the same descriptions, at least sufficiently so for all practical purposes of ordinary life.

Designed Subjective Experience. It would also be necessary to cope with processes that would enhance the opportunity for aggressively benefitting from the opportunity to engage in what was described as that "subjective experience, including his or her construction of others as part of the experiential field, the judgment of viability and the subsequent construction of an experiential reality which gain their value and relative permanence on the basis of their intersubjective compatibility" or, in more pedestrian terms, to take part in group processes that are designed specifically to facilitate learning from others. A question may be raised here about the extent to which such designed subjective experiences may be effective. This question can be dealt with and will be later in this manuscript.

SOME SHORTCOMINGS OF THE RETURN TO FOUNDERS STRATEGY

There must be a fundamental reason why, in the human sciences, there is a constant return to the text of those founders of discursivity. What else could it be but this: there is no process available to the human sciences that will enable them to face up to the inherent difficulty of reconstructing discursivity that would correlate with the heavily-fractionated components of the human sciences? Hence rather than attempt to reconstruct, it is judged a superior plan to retain

a common, if inadequate, linguistic basement from which patching can be done as required in each individual situation encountered by an author. *The longer this situation persists, the more difficult it becomes for the human sciences to deserve the title "sciences".* This is because linguistic burden, inadequately conceived is retained, rather than amended, with the consequence that linguistic pollution spreads.

SOME SHORTCOMINGS OF THE ABSORB AND SURPASS STRATEGY

At first glance it might seem that the Absorb and Surpass strategy must have no shortcomings–that inherent in its name are the essential features required for success. How could a strategy that is willing to take on the best of what has been discovered, and then surpass that by making necessary amendments and incorporating new findings have any shortcomings?

As mentioned earlier, an essential aspect of the Absorb and Surpass strategy is the requirement for linguistic evolution that will be adequate to enable description of new findings, and assimilate them into what is learned. The Absorb and Surpass Strategy, as outlined by Rabinow, is a finding associated with Michel Foucault. Whether it has any weaknesses must be assessed in terms of how Foucault described it; not simply in terms of the name that Rabinow attached to it. Hence before any possible shortcomings of this strategy can be assessed, it is appropriate to visit Foucault's own thinking as it may be relevant to this strategy. The most relevant perspectives are those generated by Foucault in the last weeks of his life, during his visit with Rabinow at the University of California-Berkeley, where Rabinow gathered interviews and thoughts that appear in the excellent book that he edited titled "The Foucault Reader".

FOUCAULT'S LATTER-DAY SEARCH

In the freedom permitted by a post at the Collège de France, Foucault sought in the latter period of his more-than-decade long position to define sharply what could be meant by "the history of thought". He rejected these two concepts:

- The history of the analysis of systems of representation
- The history of the analysis of attitudes and types of action

as being appropriate to describe the history of thought. By rejecting the former, he bypassed what is described here as the issue of linearity of presentation. By rejecting the latter, he seemingly is omitting human behavior. What remains?

Foucault has concluded an appropriate element to describe the history of thought is what he calls "problemization" or, "the element of problems".

While his writings on this subject lack some of the clarity of much of his other writings, it seems clear that they boil down to this:

- Envisaging the problems that are characteristic of an era (or specific time period), and the collection of possible solutions that are envisaged to match up with those problems

Once again, Foucault appears to be making an assumption that binds a historian to an unmerciful standard: a linguistic precision that presumes a perfection not likely to be achieved in most problematic situations. But Foucault seems to summarize his thinking in his choice of his unexplained term "problematique". The latter is his choice to represent the aggregated set of relationships that are involved in the description of a situation–a situation which, from his own academic perspective is historical in nature.

The task of the historian is twofold: to aggregate the recordables, the numbers, the actors, the dates, the acts, the beginnings, the ends; and having done that, to construct the problematique, a significant component of which will involve a construction of the purposes of the actors.

Could there be some point in time leading up to the present moment where this mode of description abruptly collapses, to be replaced by some other, unspecified mode; or is it more likely that this mode could be applied continuously, not merely by historians, but by all of those engaged in describing situations that are beyond the purview of any single individual, but which might be constructed by an aggregate of individuals, operating with the most proven processes, using the most modern set of resources, in the best-equipped environment, with the most helpful staff?

TAKING FOUCAULT'S THOUGHT TO A NEW DOMAIN

The thinking of Foucault makes possible a strong linguistic connection to the work known initially

as “Interactive Management” and, more recently, as “The Work Program of Complexity”. It is possible to construct a linkage to the concept of *Absorb and Surpass*, but if and only if **all** of these conditions are met **in the most stringent situations that are encountered**:

- **Designed Interaction Environment.** A specially-design working environment is required to enable absorption and surpassing to take place effectively
- **Context, Process, and Content Origins.** Among the triad of content, context, and process, the proper sequence for consideration is this: context, process, and content; and strict linguistic quality control must be provided by experienced systems-wise individuals over the first two of these, while the third must evolve locally
- **Multiple-Observer Science.** Multiple-observer scientific observation is necessitated as the origin of data
- **Enabling Mechanism for Nonlinear Linguistic Productions.** A high probability of nonlinear linguistic products of human interaction is presumed, necessitating the use of computer assistance in logic constructions
- **Role Preparation and Comprehension.** The role of the specialist is an enabling role for group activity, rather than an issue-resolving role in absorbing and surpassing; while the role of local observers is essential in description and resolution of the problematic situation

THE PRAGMATIC CONCEPT OF “PROBLEMATIQUE”

Formal logic reached its current pinnacle at the hands of Augustus De Morgan in 1847, and was prominently hailed by America’s foremost logician, Charles Sanders Peirce, later in the 19th century. Yet even the informal application of De Morgan’s ideas finds little or no place in most of American higher education, not to mention the absence of the formal side of logic.

It would be easy to discount this situation as a consequence of the failure of American higher education in the mathematical arena, or as a consequence of the belief that formal logic is too weak to be useful (something that could easily be seen as a consequence of the failure of teaching in the philosophy departments to go much beyond the syllogism as a formality of logic.)

But CSP himself drew the proper point of view when he argued that human intuition is much more

to be relied upon than logic, **unless that logic be formal logic**, and CSP went even further. He saw formal logic, ethics, and aesthetics as the "normative sciences". Further he saw them in a decision hierarchy. Formal logic provided support to ethics, which dominates formal logic; and formal logic and ethics together provides support to aesthetics, which dominates both of them.

"Although Peirce came to recognize the nature and role of the normative sciences only late in his career, he was nonetheless convinced that his account of the hierarchical dependence of logic on ethics and of ethics on aesthetics was a discovery of fundamental importance for a correct understanding of his thought..."

Potter, page 78.

Rather than reconstruct human purpose from centuries away, why not construct it as the product of a multiple-observer group, enabled to do so with computer assistance, De Morgan's logic functioning in the background, to enable the problematique to become the product of group work? Why not precede such an effort with a conscious process to construct and hone the linguistic foundations that are essential to lend the problematique a linguistic integrity that would be virtually impossible if its language were drawn from multiple observers with no attempt to ensure a commonality of comprehension? Then why not let the normative science be operative, by incorporating in the inputs of the various observers whatever point of view they may supply to the logic; such points of view reflecting their own asserted views, inherently colored by their openly reasoned ethic, and influenced by their own internal aesthetic, whether stated or left as a quiet influence on a contribution to each small component of logic that ultimately comes to a conclusion in a logic structure called the "problematique"?

If this occurrence sounds fanciful, let it be known that this has happened hundreds of time in the past two decades, almost invariably with great success–success as measured by those who were involved in the construction–success as measured by the outcomes of the work–success as reported by those who contributed to the publications that present the results for public view.

This being the case, with success having transpired over more than two decades, why should it be so that so many failures are described regularly in the press, in politics, in banking, in enterprises? There are multiple answers, but if they are all summarized in one phrase, it can be this: lack of awareness, in spite of the best efforts that have been made to create awareness.

A followup question as to why, with many systems in society whose function might be thought of as creating awareness, those systems have not provided the awareness, must be left to the reader to answer.

END NOTES

Much of what I refer to in this paper reflects readings that I have enjoyed over a long period of research and the specific references are more or less lost in antiquity as they say, just like I am tending to be lost in antiquity. This is not quite as bad as what Sir Geoffrey Vickers is reputed to have done with his works when he passed away, having burned a lot of it saying that he wanted to leave a lot of room for re-discovery. Anyway I am furnishing as much detailed reference material as I can put my hands on. I note, for example, that much of the old material can be found using the modern search engines. For example, if you type in Kant and obedience, you could find something like this:

> "Enlightenment is man's leaving his self-caused immaturity. Immaturity is the incapacity to use one's intelligence without the guidance of another. Such immaturity is self-caused if it is not caused by lack of intelligence, but by lack of determination and courage to use one's intelligence without being guided by another. *Sapere Aude!* Have the courage to use your own intelligence! Is therefore the [heraldic] motto [*Wahlspruch*] of the enlightenment. - Immanuel Kant (1949, 132) In November 1784, the *Berlinische Monatschrifte* published Kant's response to the question, "What is Enlightenment?" which the magazine had posed earlier that year."

and the writing continues with a discussion of obedience, etc., as described in our text.

The writings of Peirce, on the other hand, can be found in almost any book store in several paper backs selling under $20, edited by different individuals who have sampled his works. Or if you choose to purchase from the Indiana University project on Peirce which has been editing his works for many years, you can get several books of his writings, or you can find a gold mine of materials through Professor Kenneth Ketner of Texas Tech University who holds the Peirce Chair at that institution.

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