

*B.F. Skinner's Radical Behaviorsim:
Logical Positivism or Dialectical Materialism?*

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Looking back upon the historical development of philosophical and scientific discourse in the West, one is tempted to remark - from the viewpoint of a current science of human behavior - that it seems the world is in the business of gradually teaching us successively more accurate forms of describing what it is doing. And, in spite of the risk of oversimplification, I want to discuss this historical development as the generation of a triumvirate of verbal practices or explanations within the philosophical and scientific community. These three explanatory "languages," in their order of development, are (1) idealism, and its more recent variation, mentalism; (2) mechanistic materialism, and its contemporaneous moves to avoid slipping back into idealism, logical positivism; and (3) the most recent, and most accurate or "scientific" of these practices, dialectical materialism. It appears with the first two patterns of explanation must occur within a scientific verbal community before the third emerges, for this pattern has prevailed in both the development of science, in general, and the development of the science of behavior, in particular. I will say at the outset that the science of behavior is Skinner's Radical Behaviorism, and that this science should certainly be regarded as a form of dialectical materialism, as the term is employed in this discussion.

The Genesis of Idealism in Hellenistic Thought

Early Greek thinking was, to be sure, primitive, but it was also free of many of the vagaries that would appear in the thought of the third and fourth centuries B.C. One point of particular interest is to be found in the descriptions of human behavior in the *Iliad* of Homer - there is little appeal to inner causes in these descriptions. People behaved appropriately with respect to their circumstances, and if heroics were required of the character - i.e., some form of remarkable behavior not normally occasioned - the narrator invoked the hand of one of the gods of the Pantheon to manipulate the characters directly. Surely godly intervention is no foundation upon which to build a psychology, and it did not satisfy the Greeks for long. But, there arises a problem, as Jaynes (1) puts it:

There is also no concept of will or word for it, the concept developing curiously late in Greek thought. Thus, Iliadic men have no free will of their own and certainly no notion of free will . . . Now this is all very peculiar. If there is no subjective consciousness, no mind, soul, or will, in Iliadic men, what then initiates behavior?

We will not follow Jaynes' answer to this question into the "break-down of the bicameral mind" as the "origin of consciousness," or even talk about the supposed subjective states of these people, or absence thereof. The only useful point to be made from the *Iliad* is that at that time people did not describe behavior in terms of inner causation. The practice was absent from the verbal community because it required a philosophy of idealism, which took the next four or five centuries to erect.

By the fifth century B.C., the Greeks had begun to philosophize about the nature of the world around them. Especially in Ionia, competing points of view were debated and even subjected to empirical observation. Thales contended that the world was fundamentally one substance, which he identified as water; which was differentiated into the objects ("things") of the world by an active process inherent in the substance. This was elaborated by Anaximander to include three other basic substances, air, earth

and fire, which issued, like water, from the one fundamental "stuff." Anaximenes concerned himself with the manner in which the "many" issued from the "one." There was Heraclitus' thought about the universality of change or process, and Xenophanes suggesting that these processes were all natural, and not the effects of godly personages. What is transpiring is the development of a natural monistic philosophy and the glimmerings of an empirical attempt to account for observable phenomena in terms of observable variables or, at least, the description of processes.

During the fifth century, the Greeks began to experience difficulty with the notion of change. Briefly, Parmenides uncovered the seeds of the existence-versus-essence problem, which still is sometimes raised. If a thing exists, how can it be that it changes into something it was not? To Parmenides, it could not - change implied a self-contradiction, and was, therefore, an illusion. To see a changing world was to see an illusionary world. Reality had to be changeless. It was then for the Pythagoreans to "discover" this changeless order in mathematics and geometrical relationships. And, so for the Greeks of the fourth century B.C., physical substance was replaced as ultimate reality by numbers and their relationships. Observation was replaced with formal mathematical knowledge.

At this point, it would be easy to assume we have arrived at the beginnings of idealism - and, to some extent that is true. But, this is not the full-blown pernicious brand of idealism with which Western science has had to contend. That form of idealism awaited an attempt to reconcile Parmenidian doctrine with that of Heraclitus, and the attempt was made by Plato. It should be pointed out that systems of thought based upon pure idealism, such as solipsism, or the work of Berkeley, Hegel, Leibnitz or Schopenhauer provide no great threat to a scientific analysis. The fruits of a scientific treatment of the world as real and material render such world views merely interesting footnotes in the historical development of philosophy. What has caused great difficulty in the development of science has been the impure version of idealism, usually referred to as metaphysical dualism. This is the brand of thinking we inherit from Plato's reconciliation. Plato's Doctrine of the Forms is too well known to occupy a great deal of space here; however, a few points should be reviewed. Plato held that there were, in fact, two worlds or realms. There is the realm we apperceive through our senses the material world of Heraclitian change in time and space. The other realm is that of the "ideai" or forms, which, existing outside of time and space, is eternal and changeless. Obviously, the nature of the forms would prevent any causal interaction with the material realm; they passively influence men because they are the only objects of thought. So, to the extent that a philosopher seeks perfect knowledge and is compelled to more fully participate in the forms, they can be said to draw him and thus affect behavior. This notion was developed by Aristotle as "Final Causation," though Aristotle did discard Plato's dualism and dealt with the forms as inherent potential toward which a material object develops. The difficulty with Plato's two realms becomes acute in the *Timaeus* where he attempts to describe the creation - or the initial imparting of formal characteristics to the insensible material world. To account for the process, he invokes the "Demiurge":

The *Timaeus* is Plato's attempt to carry out the program of rationalist cosmology that Anaxagoras had promised had failed to fulfill. The Demiurge is portrayed as the agent who turns the initial chaos into a cosmos. Like a

human craftsman, he arranges existing materials and does not create them. (2)

Plato adopted the term *Demiurge* from earlier Greek writings - the term appears as early as the *Iliad*, and he doesn't seem, initially, to give the notion much weight as a metaphysical explanation. However, some notion of God/Demiurge is given responsibility for first fashioning the "soul" of the world and then the "noos"/soul/psyche of man. The psyche comprises two portions - one reflecting the forms and one reflecting material substance. The formal aspect of the soul contained ideal knowledge, for which the psyche was charged to re-discover through philosophical reflection (as in the Allegory of the Cave found in the *Republic*). Failure to seek this knowledge results in a reincarnation at a lower level of being, which explains the existence of all other life forms. Philosophy, successfully undertaken, produces a transcendence of the soul upon death. The important point here, is that by introducing the *Demiurge* in such a capacity, one reverses the direction of causality *from* the realm of the forms *to* the material world. This is a move that will result in a good deal of trouble, experienced still.

Plato's student, Aristotle, spent his career attempting to undo this problem in Plato's thinking. As noted, he denounced the dualism and interpreted change or development as a gradual expression of innate potentiality. Aristotle, like Plato, considered man's reason as his highest faculty, which was regarded as immortal. In fact, for Aristotle, that man was the only animal of reason was what separated him from the animal kingdom. In service of reason, Aristotle developed a system of classifying "scientific" observations. He also generated a system of reasoning about talking - his logic. A basic point of the logic is the syllogism, in which two premises of necessity lead to a conclusion:

- | | |
|---|------------------|
| I. | II. |
| (1) All Skinnerians are Behaviorists. | (1) All X is Y. |
| (2) All BFSAs members are Skinnerians. | (2) Some X is Y. |
| (3) All BFSAs members are Behaviorists. | (3) Some Y is P. |

There are many forms, but the logical move can be simply shown as "If (1) and (2), Then (3)." This "If, Then" logical form, developed by the thinker heading the initial reaction to Platonic idealism/dualism, will be united with the atomism of Democritus and Lucretius in the "clockwork" notion of the universe and will yield the basis of mechanistic materialism in the seventeenth and eighteenth centuries. But, before turning to that development, we should continue with the evolution the idealist trend, but not as a development in philosophy - instead, as it becomes doctrinized as theology. The reason for this move is that speculative philosophy has never been a source of social practices in Western civilization after the Greeks. Rather, it has always been a result of what particular thinkers were able to say - in a sense - at different times during the last 2000 years. The vehicle by which idealistic/dualistic thinking exerts its influence on our cultural practices has been religion.

The Roman Empire as Mixing Pot

It was roughly the period 200 B.C. to 300 A.D. that the Roman Empire extended and maintained its control over the bulk of Europe and the coast line of the Mediterranean Sea, in particular the Eastern shore. I am giving short shrift to the process by which the Romans borrowed the philosophy of the Greeks, for it adds nothing to this account. Suffice it to say

that Plato's dualism, his emphasis of reason and something of his vague notion of the immortality of the soul was available in that culture during this period.

What I am reaching for is some outline of how the West's conception of man evolved, for this conception sets the tone for social practices and psychological and scientific methodologies of the present. The next ingredient of the Roman mixing pot was Hebrew thought. This conception of man was that of law follower, for the Hebrew notion of Yahweh was law giver. Early in their history, the Hebrews were not monotheistic, believing that each group of people had their own tribal god, and it was not until Moses' covenant with Yahweh that they settled on which god was theirs. The point here is that from the Covenant the Hebrews conducted their affairs with respect to the Law of Retribution - follow the laws of God, and He will treat the people with justice and compassion. By the time of the Roman Empire, belief in this tradition was breaking down. Religious practices had not freed them from bondage, first in Persia and then under Roman occupation. What was beginning was talk of political action and revolution, which had a great deal to do with the reception Jesus experienced - both from the Jews and the Roman establishment. During the two centuries after the death of Jesus, it became clear that a grass roots political movement could never cope with the power of Rome, so "salvation" had to be sought in other directions - other wordly directions. Under these circumstances early Christian doctrine was fleshed out, and the revolution in the Roman Empire occurred in a religious, not a political way, culminating with Saint Augustine's neo-Platonic version of Christianity. When the Roman Empire collapsed under its own weight, what remained standing as a legacy to Medieval Europe was its massive and extensive ecclesiastical skeleton - the Roman Catholic Church, which held sway until the seventeenth century.

The Rise of Science and Mechanistic Materialism

I have not spent this energy because it was felt that anyone necessarily required a dose of religious training. It was offered to place into some kind of historical perspective the process of successive approximation by which men come to speak and act more precisely with respect to the world they inhabit - this process I call the development of science. As pointed out, the early Greeks began on the right foot, but tripped over Parmenides' problem with change - then landed, quite off-balance, with Plato. Parmenides failed to handle the obvious changes occurring about him, so Plato "made up a story" to "explain" his difficulties. A little known modern thinker, L.L. Whyte, said "Thought is born of failure." (3) And, I heartily agree. "Thought" is verbal behavior - a source of additional stimuli, to which more verbal and non-verbal behavior can be conditioned. I contend that the rise of science is a process of continually dis-engaging previous verbal behavior as a source of control over "scientific" activities, and a continual re-engaging of the material world as a source of "control," - i.e. science is empirical behavior under the control of the data under investigation. Philosophy is, in the main, investigative behavior under the control of previous verbal behavior - as is theology. By the 17th century, the Universal Church of Rome represented a great mass of collected verbal behavior (dogma) used to control the behavior of most of western society, typically resorting to control through aversive techniques. Many of the extant secular bodies were also "cashing in on" the

aversive control of the church to maintain control for class distinction, and aligned with the church. Such areas (like Italy) acted to retard the initial beginnings of the scientific revolution of the 17th century (see an account of Galileo's attempts to proclaim the advantages of Copernicus' organization of the solar system over Ptolemy's). Other secular bodies (like the British Kingdom and Germany), for their own leaders' reasons, sought to disengage from the Universal Church, and it was in those areas that scientists were allowed to investigate the material world and publish the results of such work. For the purpose of brevity, I will simply cite five persons greatly responsible for the rise of science - though, there are many others. Two, Copernicus and Galileo, were already mentioned; to these I add Bacon, Kepler, and Newton, to no one's surprise. Two other persons are important - Descartes and La Place - but, they play bigger roles in another portion of this account.

I want to take a director's aside here, and state that we are going to cover the story of science's encounter with the three greatest "antagonists/enemies," for lack of other words: religion, philosophical idealism/dualism, and its own initial self - mechanistic materialism. And, onto the first.

It would be impossible and unnecessary to account for all of the variables leading to the bringing of the verbal behavior of the early scientists under the control of the material world; however, one important variable was the weakening effect of the new systems of planetary arrangement (Copernicus, Galileo and Kepler) on the authority of the Church's doctrines. These moves toward descriptive simplification were quickly followed by mathematical systems of description (Newton, Leibnitz, Descartes), which allowed more accurate prediction. The process is reinforced and further applications are made. What I am centrally concerned with here are the generalizations in verbal model building that occurred - especially, with Newton. Newton, as was true for the others, was a devout Christian, and was not concerned with addressing the metaphysical position of the Church. Though his work redefined the function of God, he did not attempt to remove the notion, and it would be unrealistic of us to have expected any more. Basically, Newton made five moves. First, he assumed the world was simply material, ordered and describable, in other words he ascribed to empiricism. Secondly, Newton accepted the atomism of Democritus (among others) which held that the universe was ultimately composed of a finite (qualitatively so, at least) number of basic kinds of indivisible particles. Thirdly, it seems, Newton followed Aristotle's logical operation of "If, Then" - which shows up in his notion of causality. Given a specifiable set of circumstances (the "cause"), we can observe a second set of specifiable circumstances (the "effect"). So that "If, Then" is replaced by "Cause, Effect." Fourthly, Newton constructed a model by which to understand material movements-and in doing so, he generalized from the familiar. He conceived of the world as a cosmic machine or clockwork mechanism. And, fifthly, he devised a mathematical language-his calculus-to describe and predict the mechanical motion he expected to see. Since he "stacked the deck," so to speak, by his pre-conceptions, he saw exactly what he expected. I do not want to subtract credit from Newton for his accomplishments, for they were colossal, given his circumstances; but (an important "autoclitic" here) it was *only* an initial approximation to the tremendous subtlety and variety of material motion to be observed. I will call Newton's cause-effect mechanistic materialism the "Newtonian paradigm" (to borrow Kuhn's

term). And, the great clock-work mechanistic notion of the universe was conceived, and it proved to be very, very effective. And, science, verbal behavior under the control of the data, began its illustrious career. Finally, by the beginning of this very century, the mechanistic materialism of early science had produced the atomic theory of Rutherford, which portrays the Democritian atom as a tiny solar system. Physics, trying to follow mechanistic materialism with this concept will shortly pass into a great amount of trouble. And, this trouble with particle physics will provide the first real evidence that the mechanistic materialistic paradigm is in error. Newton and La Place had placed great stock in the belief that, if one could take into account the positions in absolute space of all atoms/bodies, their speeds, accelerations (or "forces" acting upon the atoms), and directions (in the three dimensional absolute space), all possible material phenomena could be predicted. Now, for gross objects/events, this idea is serviceable-it is an initial approximation to the truth of the matter. For Newton, the trouble with the model occurred with respect to acceleration of bodies. He was led to talk about a "force" or an "action at-a-distance" we call "gravity." He fell back upon God or a universal ether to account for these problems in his calculus, a move which worked until 1905, when the work of Einstein came to light. Problems with the notion of atom or particle were beyond Newton's world-view, but they will plague the physics of the 20th century. Again, in another way, let me say that the billard ball (or, "balls bouncing off balls and bodies bouncing off bodies") paradigm was a first approximation of our verbal behavior about the material processes of the world - and, it *did* work for about 200 years for physics and astronomy (the proving grounds of Newton's calculus). But, the issue here is not centrally physics, it is "psychology." And to follow that thread, I must return to the 17th century - to the thinking of a French philosopher and mathematician, Rene Descartes.

Descartes was a contemporary of Newton, and his problem was the same - how to deal with the authority of the Church. But, as Newton was a scientist, I would have to classify Descartes (at least, in his influence upon us) a philosopher. Newton invented the mechanistic-materialistic paradigm - Descartes perpetuated and invigorated idealism, or specifically dualism. Why was Descartes, in spite of the new scientific inquiries of his time, which were addressing a new materialism quite in contradiction to Catholic dogma, involved in extending a dualism? I admit that I don't know. Our history may have an answer I haven't teased out - but I have a suspicion regarding the matter. Descartes *was* a Christian, and though he was not under the same clerical pressures Galileo found himself under, maybe he *believed* it (Christian doctrine). Now, as I think about a sensitive Christian philosopher's situation in that period, I am reminded of the break-away of Newtonian science and the threat. That must have been a tumultuous situation! Descartes was interested in mathematics, and to save it from an official abnegation, some "clever" moves were called for. Descartes seems to have had two problems to deal with: (1) the run-away success of Newtonian materialism; and, (2) the very popular idealism of the philosophy of his time. Could he bring these two horns of thought under control, so that they would not bring down the position of the Church? Well, not many can push materialism or science around, but idealism (or religious doctrines based upon it) can be shuffled for convenience. So, I see Descartes attacking idealism, rather than touching materialism. However, by attacking a

philosophy, one gives it credence, of a kind. Descartes did just that for dualism.

Descartes' Entrenchment of Dualism - Plato Revisited

According to Russell, "Descartes is usually considered the founder of modern philosophy." (4) I am inclined to agree, though I see his influence at least as profoundly upon psychology and upon the thinking and speech of members of our verbal community. I mentioned before, that "maybe" Descartes really believed Christian doctrine - I say now, of course he believed it. His philosophical contortions were designed to salvage that doctrine in the face of the newly erupting Newtonian mechanistic materialism, which seemed to threaten to sweep God right out of the cosmos. What would his reaction have been? I will confess at the onset that I have never read the following account of Descartes' thought in any philosophical analysis - in fact, I made it up as a somewhat plausible story of what it was that Descartes was doing in his philosophizing. As it, to some extent, derived from the thought of Plato, Christian doctrine was unquestionably dualistic. To respond as he did, Descartes must have felt some form of defensiveness toward that doctrine. Newton had harshly emphasized the material aspect - God had been reduced to the cosmic clockmaker who now sits and watches (no pun intended) his "handiwork" work. To maintain the dualistic balance, some emphasizing of the idealism needed to be done. But (another important autoclitic) pure idealism is very, very dangerous to a dualistic Christian position. After all, the Scriptures tell of a God and His realm (idealism) and of a material creation, which was called "perfect." Descartes could not too strongly assert idealism to balance the Newtonian threat, for problems would accrue from that. If idealism is too powerful an influence, the next step (from dualism) is pure idealism - everything is "in my mind" or "is a figment of my imagination." The aberration of thinking that would quickly follow from this is "Therefore, I am God!" Descartes could not abide this - nor would the Church (!) - so, it was not a sufficient response to Newton to just reaffirm idealism. Descartes had to reinforce dualistic doctrine. Skinner (5) writes of Descartes visiting the Royal Fountains of France and being rather taken by the lifelike appearance of the hydraulic statues there. It seemed to Descartes that all of the actions of animals could quite well be portrayed in such a mechanical fashion. Even many human behaviors were very believable in these statues. Descartes must have been quite impressed by this display and deep in thought about it as he returned from his trip to the fountains. It seems that he was led to crib Plato and to divide the world into the realm of thinking and the realm of activity - as opposed to the realm of changless forms and that of constant change. Almost all we see is of the second realm, and it is well described by Newton's calculus; however, because Man is a rational animal (from Aristotle/Plato), some human actions are divinely inspired. In fact, the most "human" of human behavior is so caused by the "rational soul" - from the realm of God/Forms (Descartes, in fact, called Plato's highest form, the Good, "God"). Plato had started causality's path from the realm of the forms to this world with his Demiurge. Christianity had made a religion out of this move. And Descartes, finally, revitalizes dualism as a philosophical position by restating Plato's position *against* 17th century science. The early Hebrew prophets live in us all, for we all tap into the divine "rational soul" (or it taps into us and our behavior) through the pineal gland. The only real difference

between Plato and Descartes has to do with the supposed "location" of that "other realm of influence." For Plato, the realm of the forms was at "some-other - else-where" beyond time and space. For Descartes the other realm of causation is to be found within our own consciousness - in our bodies, in our heads, the pineal gland serving as the serviceway of its influence. Aristotle's rationality became the divine within man, and stands in the same relationship with respect to admirable behavior for Descartes as the gods of the Pantheon stood in the *Iliad*. Two thousand years have elapsed without any essential progress in our ability to analyze human behavior. However, it must not be forgotten that to scientists or philosophers of this time "explanations" of human behavior were not pressing matters. After all, if one desired an explanation of someone's conduct, you had but to ask him; Descartes was impatient to get to the business of mechanically explaining the action of the human body, which could not be rationally introspected. The "mind" or the "soul" apprehended its own reasons, but those of the "heart" were another matter. Descartes' assumption that the bodily activity of men and animals would be subsumed under Newtonian mechanics, and his move to separate rational "mind/soul" and to leave it to late philosophers to analyze will set the pattern for the development of psychology. Boring explains some of the trouble that will arise from the study of the "mind:"

Much confusion has resulted from the fact that both *soul* and *mind* are *l'ame* in French and *Seele* in German. It is much easier in English to keep psychology separate from theology. 6

Of course, this terminology can explain some of the confusion, but a more important cause of the problems resulted from the move toward nativism and innate ideas. This issue will not even be noticed until Freud, or clearly understood until Skinner points out the reasons for the limitations of self-knowledge (as verbal behavior).

Developments Until the Beginnings of American Psychology

From the Englishman, Newton, we moved to spend time with the Frenchman, Descartes. Now, we must jump back across the Channel to Britain to note the development of British Empiricism. No doubt influenced by Descartes, a little progress was, however, made by John Locke with his notion of the mind as a *tabula rasa*. Though, for our tastes, British Empiricism is hopelessly idealistic, Locke *did* succeed in avoiding the pernicious doctrine of nativism. He regarded the mind as a mental place, but the ideas of the mind were seen as generated during the life of the individual through, first, sensation, and then, by reflection upon sensation. I will assume that sensations are presented to the mind because of our physiology; but then, one was able to reflect upon sensation, and, through the process of association, produce new combinations of simple ideas about sensation. Once there, such a mind could analyze complex ideas, discovering the simple associative building blocks. Obviously, British Empiricism was not empirical (as we employ the term).

From Locke, the Empiricist cloak fell to Bishop George Berkeley. I have mixed feelings about Berkeley. His thought is useless and of no consequence, except as a method of making idealism unpalatable - which is why I have good

feelings for him. His total denial of matter, affirming the mind as the immediate, thus the only real, reality (after all, thoughts about matter were only "matters" of the mind) was easily seen as the first philosophy this side of an absolute solipsism. And the Empiricist school moved quickly away from Berkeley - we didn't need to return to the problems experienced by Parmenides regarding motion. Such a move would never have been taken seriously by those enthused with Newton's fixation on motion as an absolute. Newton is relevant here because the next person to consider is David Hume (we have reached the middle of the 18th century, after Newton's *Mechanics* have proven greatly successful).

Now, Hume is a very intriguing character. He was an idealist - he talked about material events having sway only because they had been reflected into the Cartesian "mind-space." He dealt in mental impressions and ideas, but his thinking had a solidifying effect upon the materialistic philosophers of his time - namely, Thomas Hobbes' followers. Newton relied on his familiarity with clocks and machines as a way to describe the notions of causality he needed. It seems that Hume's idealistic causality was used to refine the mechanistic notion of causality. According to Hume, two sense events (I use "sense" as mental) might lead the bearer (locus) of the events to assume a cause and effect relationship if they were both approximate in what appears to be Newtonian time and space, and if what appears as the cause occurs prior to the supposed effect. Hume added another qualification (which implies he had a foot in materialism). There must appear a "necessary" connection between the supposed cause and effect sense events. Hume meant "necessary" to imply that simple contiguity was not enough to establish an apparent cause-effect relationship. What is required under his mode of thought, I cannot imagine - except some kind of physical or mechanical connection. Hume goes on saying that we can have association by contiguity whenever two sense events occur nearly together in time and space perception; but, a robust cause and effect relationship will accrue only if such events *always* occur (are perceived) together. Well, I really don't know what to say of Hume's thinking, at this point, except that an idealistic point of view can always be argued, by anyone. All one can say in response to it is "why do you 'want' to say that?" Or, more precisely, "what reinforces you for saying that?"

I mention David Hartley here only to state that he was responsible for insisting upon the concept of association so strongly that it was incorporated into the body of British Empiricism. And, after Hartley's time, this movement in thinking, correctly, dropped the "Empiricist," and adopted "Associationism." And, so we have arrived at the territory of the Mill family - James and John Stuart.

Nothing truly important comes from this part of the story, except continuity. It seems that the thinking of Newton got to that of James Mill, because he talked about mentalistic/idealistic phenomena in terms of association as a mechanical principle which, now (strangely), occurs in the "mental" realm. Between the time of the Mill, Sr., and Mill, Jr., chemistry was fully employing Newton's mechanics. So, John S. Mill, Jr., made his way by reinterpreting his father's mechanical mentalistic associationalistic (words sometimes cannot keep up with our zeal to communicate!) view in terms of a new mechanistic/atomistic chemistry. Finally, with Herbert Spencer, we consider a member of the British Associationists whose life spanned into this century, and modern influences can be expected to reveal themselves.

And, Spencer offers us an evolutionary form of association. It seems that repeated associations can, through a kind of law of frequency, acquire a greater tendency to show up in future members of a species. It appears that Spencer's notions stand directly between Descartes' concept of innate ideas and Carl Jung's construct of the collective unconscious of racial memory and his archetypes. Since Jung's biggest influence was Freud, we have at this point reached a juncture in the account where we must stop (we will pick it up later), and return to the 18th century, this time to the thought of Germany.

One certainly cannot talk of German thought without acknowledging Immanuel Kant. Kant holds little interest for Radical Behaviorism, for, at best, he was a dualist - but his emphasis contains seeds which can only lead to subjective idealism and solipsism. For Kant, there were, also, two realms, the "noumena," or "things-in-themselves," and the "phenomena," or things as they are represented in our sense data. The "noumena," which supposedly comprise the real world, are forever unavailable to us. The notion of causality was, for Kant, an innate idea (category) by which we come to order phenomenal sense data. We can say that Kant was the founder of the famous German tendency to be idealistic. He re-affirmed dualism and he was an absolute nativist, but he set the tone for the new "experimental psychology" that was about to arise in Germany.

The new psychology was begun by Fechner, as he attempted to bring empiricism to bear upon the process of sensation, initiating psychophysics. We probably remember him best for his mathematical treatment of the work of Weber, called "Weber's Law," which gave psychology the notion of "just noticeable difference" with respect to discriminations among various amplitudes of stimuli. One thing about Fechner is important - he was supremely interested in consciousness, though he conceived it in a mentalistic/idealistic fashion - as a different kind of "stuff." The study of sense physiology, to bring the dynamics of "sense data" under a mechanistic analysis, was continued by Hermann von Helmholtz - especially in the area of color vision theory.

The real high-point of this school was achieved by Wilhelm Wundt, with the founding of his laboratory in Leipzig in 1879. What Wundt wanted to accomplish was to ferret out the nature of consciousness under empirical conditions. His tool was introspection, and by requiring his subjects to "sink" into their on-going conscious experience and reporting, he wanted to establish the structure of consciousness. Thus, his method is called "Structuralism." He obtained the services of an American graduate assistant, Cattell, who would later be instrumental in transferring this kind of psychological method to the U.S. Another conduit of this brand of thought into the U.S. was the Englishmen, Titchener, who studied with Wundt and then left for the U.S.

In addition to the Structuralist movement in Germany, there was another important direction of thought. It begins with Franz Brentano, who wrestled with the difference between mental acts and physical events. Basically, he reasoned that mental acts are to be distinguished by the fact that such acts all possessed the property of "intentionality." Physical events did not possess this trait. Mental acts seem, by their nature, to intend toward a goal or an object. One does not just think - one thinks *of* something. Whereas physical events occur mechanically, beginning with a cause that then produces an effect, mental acts go beyond this

point. They almost seemed to be effects (to use the term loosely) that intended a goal. It is not difficult to move backward to see the influences of Aristotle or forward to see the effects upon American motivation theory in psychology. But, I want to hint at the reasons that this line of German thought has been included. The intentional aspect of mental acts has been of vital importance to both philosophy and psychology. But, (I state it here and hope to illustrate it later) "intentionality" has never been dealt with successfully by science until Skinner's Radical Behaviorism solved the problem by describing "operant behavior."

The next step in this line was taken by Husserl when he introduced the field of Phenomenology. A Kantian at heart, Husserl decided that since Kant's "phenomena" were the only data to which we own access, they should not be studied as we usually study - in the strait-jacket of our learned preconceptions. They should be apprehended by our native "pure unreflective consciousness." To achieve this end, he proposed a method called "bracketing out" of preconceptions. The program consisted of attending to the "phenomena," and letting thoughts about them arise. These thoughts have been learned - recognize this and remove them from your perception. Once all preconceptions are allowed to arise and are bracketed out, a purely phenomenological apperception of the phenomena will occur. By this process, one will come as near as possible to the seeing of the "thing-in-itself," the "noumena" of Kant. Husserl was, however, a philosopher, and we owe the adoption of this kind of analysis by psychology to Husserl's student Stumpf. Husserl's thought in philosophy is represented today by Heidegger. Stumpf, however, was the teacher for both Kohler and Koffka, who, with Wertheimer, were to initiate Gestalt Psychology - which would also come (with the three of them) to the U.S.

The final German trend I want to include begins with the German followers of David Hume - specifically Ernst Mach, Karl Pearson and Richard Avenarius. At this point, I have to introduce a very troubling term: "Positivism." I call it "troubling," because I feel many people have no clear notion of what it means - nor do they understand that it occurs three times - quite separately - in the history of philosophy. And, as a result of this, the term is tossed about in great confusion - both speakers and listeners not knowing what is, in fact, being referred to in the arguments. I will return to this issue when I finally get to address Skinner; but, for now, let it suffice to simply mention the three "Positivisms" that arose with the admonishment to keep them separate! The term "Positivism" comes to us from a Frenchman, Auguste Comte. The issue falls onto what can be accepted as "knowledge" or basic data in any science. Comte was interested in the interactions of the individuals in a social grouping - our first sociologist. "Positive" knowledge, for Comte - i.e., basic data - could only be that "knowledge" achieved through social interaction. But for Comte, the issue ran to a much deeper philosophical current. Given the horrible situation that the idealists described - Kant and his phenomena, Descartes with his innate ideas, Hume and the Mills with their sense data, and with the rise of the phenomenological point of view - what, after all of this could be called "real"? Anyone could, after all, dream up anything. If we all dream up our own worlds, what can science do to decide what is the real interpretation? Simply, Comte says, by locating the majority opinion on the issue - which gets done every day in real societies by its members.

So, basic data, for a science, must issue from an agreement of its individual participants, and nothing else. This is what I call "good" positivism, and we shall meet it later in the work of B.F. Skinner.

What I call "bad," or misguided or wrong "positivism," we have already been introduced to by Mach, Pearson and Avenarius. A later form of this kind of thinking will arise in the 1930's in both the U.S. and Europe, championed by such people as Schlick, Carnap, Ayers, Feigl, Bridgman, and Wittgenstein (though, I admit and submit that this later philosopher did manage to "change his stripes."): What Mach, Pearson and Avenarius managed to do was to reintroduce, by their emphasis on sense data, an idealistic (or personally subjective) realm, as opposed to a "real," objective material world. This move would have been quite acceptable two hundred years earlier, when religion and idealism commanded nearly all the attention of thinkers. But, by the middle of the 19th century, materialism had become heavily established by the success of the Newtonian movement in science. And, as a result of materialism's scientific success, other thinkers thought other things about this material world. And, I could not imagine two more influential people of this time than Darwin and Karl Marx. We will certainly have occasion to return specifically to these gentlemen. Before doing that, however, I want to shift gears to consider, for a moment, the character of the development of psychology in America.

Psychology in the U.S. or the Genesis of Methodological Behaviorism

When I utilize the terms academic psychology or methodological behaviorism, I am making a distinct discrimination of a certain line of thinking from what is generally referred to with the rubrical term "psychology." This distinction does not include the work of B.F. Skinner, Humanistic psychology (the so-called "Third Force"), the Psychoanalytic movement, or any other "flashy" new-comer to the field. Defining the boundaries of this discrimination is the point of this section.

As the 20th century dawned upon the state of American psychology, it was in a most sorry situation. It had been toying with the notion that it was or was about to become "science." By this time, science as mechanistic materialism had had two centuries of success, and physics was certainly the body of knowledge to be imitated. In the main, our psychology was, at that time, comprised of two camps - well known to us - "Structuralism," which we saw earlier in Germany, and "Functionalism," which we are just now engaging. Structuralism had been transplanted from Wundt's laboratory to the U.S. by Cattell and Titchener, and the push was still to discover, via introspection, the structure of consciousness. Functionalism was purely American, and basically the result of William James' writings. Like Structuralism, Functionalism was centrally concerned with consciousness, but, unlike Structuralism, Functionalism was after the function of human consciousness with respect to facilitating the ability of human beings to adapt to their environment. This is natural, since James was directly influenced by Darwin's evolutionary theories. Unlike Titchener, et al., James did not construe consciousness to be a substance that had a static form (composed of individual atoms, or sensations, structurally related to form "ideas") James interpreted consciousness as an activity or a process occurring within a person - consciousness was a stream of mental impressions of the world, which can provide

behavioral effects that may have adaptation value. This distinction notwithstanding, both "kinds" of psychological thought in the U.S. had, as a central issue, a mentalistic concern over the nature of consciousness. Emerging from the University of Chicago, John B. Watson, Chicago's first PhD in Psychology, would have none of this. All that can be said about his motivation, beyond having taken classes from the sociological behaviorist, George Herbert Mead, is that he must have been heavily influenced by the success of the Newtonian mechanistic materialism. His aim was to place psychology on a more objective or empirical basis - to finally rescue it from the morass of philosophical thought and found it squarely upon the scientific methods. For his efforts, he has been remembered as the "Father of Behaviorism" - to which I add a qualifier - the "Father of Methodological Behaviorism." We can quite safely assume that Watson did not just dream up his program in an intellectual vacuum - he was influenced by some body of writing. And, beyond Sir Isaac Newton, we can bet the source was Pavlov.

Pavlov was conducting, in Russia during the latter portion of the 19th century, very, *very* good research, scientifically speaking, into the area of unconditional and conditional* physiological reflexes. Pavlov was no psychologist; though he is generally thought to be so, he was a physiologist, steeped in mechanistic materialism. Recall, we have traced this kind of thinking from the "If, then" logical moves of Aristotle to the "cause-effect" analysis of Newton. In Pavlov's work, we are given a third re-wording of the *same logical form*. An unconditional stimulus is observed to cause an unconditional response because of the physiology of an organism; and, if this UCS is paired sufficiently with an initially ineffective stimulus, that stimulus will come to cause a conditional response, similar to the UCR, thus:

UCS → UCR
CS → CR

I will omit everything else of Pavlov's position and simply remark that, when Pavlov's work became available in English to U.S. readers, Watson was ready to latch upon it as a real scientific breakthrough in the study of the behavior of organisms. Watson "simplified" the Pavlovian scheme and applied it directly to all behavioral phenomena. Watson offered stimulus-response as the behavioristic paradigm of analysis. Simply, Watson initiated S-R psychology as a "behavioristic" analysis, destined to render psychology a level of success that would qualify it for a place in the mechanistic materialistic "revolution" of science. All behavior could be reduced to a mechanistic analysis of stimulus-followed-by-necessary response.

I am not concerned here with faithfully representing the entire careers of thinkers I mention. I am interested in broad-stroking a massive change in scientific thought. Let me just say that Watson would have us behaving quite like machines; buttons are depressed and lights go on or legs move. For him, we are just S-R creatures - to understand us, one must simply hook up electric-train-car modules of "behavior." And, as Newton showed, and as Pavlov proved, a sufficient and necessary "cause" will generate the necessary "effect." It has been nearly 3000 years, and, still, Democritus reigns in our thinking processes.

*The terms "conditioned" and "unconditioned" are used instead of the usual "conditioned" and "unconditioned" because they are closer to Pavlov's original terms in Russian.

Watsonian thinking was (and still is) a very bitter pill for us to swallow. Psychology began to catch up on our religious and metaphysical notions of "free will," "choice," and human "dignity." Today, this kind of issue still divides us, yet in Watson's time, the glove he hurled down was picked up. Watson had told us that the relationship between (his) stimulus and response was absolutely necessary. i.e., the relationship between Watsonian "S" and "R" was one-to-one: absolutely necessary/necessarily absolute. If a stimulus occurred, the appropriate response has to occur. The real trouble for American psychologists that they seemed to believe, or at least practiced, what Watson had proclaimed. And, when later American psychological empiricists tried to vindicate the one-to-one nature Watson had predicted, they failed. "S" does not always produce "R." In such a quandary, a researcher is led to two choices - patch up the approach, or, find another approach. American psychology, in the early decades of this century, selected the first path.

It was the initial assumption that proved to be fatal. Pavlov's work was based upon reflexive behavior. From him we learn two basic facts: (1) that reflexes follow closely a Newtonian cause-effect model, and (2) reflexes can be made conditional upon neutral stimuli, if sufficient pairings are conducted with the unconditional stimulus. The mistaken assumption of Watson was that all learned behavior is comprised of conditional reflexes. But, since Watson did not do much research, except for his studies in emotional conditioning, he was not forced to take note of the incompatibility of his assumption and the data that would face later researchers.

Tolman, however, did come face to face with this problem, and he was forced to re-think his position, but the "answer" he produced was largely under the control of his extensive exposure to the transplanted Gestalt Psychology of Koffka and Kohler. So, Tolman became the first "cognitive behaviorist," but, he was unusual, to say the least, among the methodological behaviorists of his day. The majority remained under the control of their traditions. Their data forced them into re-thinking also, but they did not see the error Watson had handed down to them. If data do not support a theory, one should return to that theory and modify it - but this did not occur. Watson's little bit of theory - that all acquired behavior is reflexively conditional, and therefore, "S" and "R" stand in a one-to-one relationship - was, perhaps, so "little" that its nature of being a theoretical assumption was overlooked. What these methodological behaviorists did was to build more theoretical superstructure *on top of* this fatal assumption, ALL of which was designed to clear up the "noise" in the data. It was as if they never really trusted their data. So, by the 1930's we see the arrival of a full-blown methodological behaviorism - the prime example of the fold being Clark Hull. His thinking went something like this: if in the data, we do not observe that the "S" and "R" stand in a necessary (1:1) relationship (implicit assumption - "though, we *know* they *must!*"), then, we must account for that difference in terms of changing physiological state within the organism. Watson offered us S-R psychology - Hull will try to sell S-O-R psychology; and, though the "O" seems harmless enough, almost a "natural" thing to do, there is a great deal of action supposed to be going on in there. The trouble here is that all of this action is beyond observation or empirical testing. It is just enough idealistic "explanation" to cause the whole structure to collapse as a bad attempt at science. Though it

may be a bit painful, let me remind you of a typical Hullian "description" of why a particular rat took 1.5703 seconds less time to run a maze on its second attempt:

$$S\dot{E}_R = \left\{ (S\bar{H}_R \times \bar{D}x \bar{K}x\bar{V}) - (\bar{I}_R + S\bar{I}_R) \right\} S\bar{O}_R$$

Isn't that truly enlightening? A stimulus will elicit a momentary effective excitation potential, which results from the momentary effects of habit strength, multiplied by momentary drive (with respect to the particular goal object), multiplied by momentary incentive motivation (an early version of Capaldi's "Sequential Theory" about the effects of size differential in rewards or non-reward events), multiplied by a variable representing momentary abilities of the nerves to function physiologically. Then one must subtract from the momentary habit strength the effects of physiological fatigue and those of a state of conditional fatigue. Finally, we must take into account the effect of "behavioral oscillation" - a "fudge factor" that, if all else fails, will render the relationship between "S" and "R" one to one. With behavioral oscillation, Hull seems to be trying to account for something like the rat's "darned cussedness." All of this pseudo-mathematical and logical "incantation" is supposed to have the effect of reassuring ourselves that we have "explained" what we are studying. Instead of fleeing to another theoretical position, as Tolman did, Hull doggedly strives to save the paradigm of Newton in psychology, where it is absolutely not appropriate. At best this is simply an attempt to resort to idealistic theorizing to explain why the world doesn't behave as we wish it would - at worst, it is a form of religious dogmatism. I offer the second derogative characterization, because with this form of approach much of psychology has recently become a cult which provides a place for man to worship himself. This "place" is called Cognitive Psychology. To get there from Hull's fetish with the "O" or his "conceptual nervous system," all one has to do is continue to place faith in a faltering "S-R" paradigm - to adore with greater and greater fervor the kinds of intervening variables that Hull used to "explain" the anomalies in his data. In doing so the "S" and the "R" in the original paradigmatic representation take on less and less importance, for the focus is on the varied and interesting stuff going on inside of the mysterious "O" we have given ourselves to deal with. The result is cognitive psychology, and to find a breath of science in it is impossible

impossible - beyond the terminology used to mystify its practitioners. One needs only to ask the question "what is the source of stimulus control of their 'scientific' verbal behavior - the data, or their histories of reinforcement (which includes personal interests)?" Against all of this stands B.F. Skinner, the only scientific student of the behavior of organisms we have of note.

I have been using the terms "idealism" and "mentalism" as more-or-less interchangeable, and, they are. But, I am sensitive to a further discrimination. Let "idealism" refer to all of the great systems of philosophical "explanation" we have seen - from Parmenides and Plato to Descartes, Hume and Kant. These were all also dualists. I had earlier stated that pure idealism (for instance, Berkeley's thought) has always seemed just this side of humorous - at least, for me. But, we will encounter a neo-idealism shortly, which is not at all humorous. I use the term "mentalism" to denote the recent and somewhat subversive (to the goal of

science) attempts to utilize idealistic explanatory fictions, operating within a materialistic and "scientific" framework, to further a "scientific" analysis. One example is the methodological behaviorism of Hull. I especially use "mentalism" to refer to the manner in which all of us were taught to talk about our everyday experiences. The concepts employed, we inherit, in large part, from the theological past of our culture. Some we get from ethics and treatises on Morality. Political talk serves to reinforce them in the name of "social control" of the individual. These concepts are employed in talking about our own behavior and that of others and its consequences, and function to, somehow, make us "feel" better about the whole thing. To offer specific examples, I would point to "free-will," "human dignity," "responsibility," "praise," "blame," "personal credit" and "justice" in the guise of punishment. Three contemporary psychologists speak most directly to this issue - two from the field of therapy (Szasz and Menniger) and one from science - B.F. Skinner. Only Skinner is considered in this effort - though, the others are not without importance.

So, having tried to place "mentalism" into the form required for this paper, I still feel that we must again step back into the history of our culture (circa 1850) to add some important variables that have, thus far, been omitted. I want to give the full blush of the present psychological reading of our history, but this is not possible without pointing to the important roles of Sigmund Freud and Charles Darwin.

Theology as Thesis, Darwin as Antithesis, and Freud as Pseudo-Synthesis

To set the scene, recall that the power of the Christian interpretation of the world had been in very firm control of the thinking of most people since 300 A.D. Though science, as mechanistic materialism, arose in the 17th century, and enjoyed a very successful 200 years; and, though the various forms of idealistic and dualistic philosophies battled with that science throughout that period, most people did not hear of this lofty warfare. Education, as we know it, didn't exist. Most people learned what their parents knew - or what the local church would provide: after all, their's were lives of "getting along" and surviving.

But, in the middle of the last century, because education of our kind had finally reached the middle class, a problem erupted. In brief, people, who had been weaned on the teachings of the Church, involving dualism, life-after-death, just rewards beyond life, etc., were then sent to a form of higher education which taught them the mechanistic materialism of the times. But, they weren't just taught Newton's mechanics - they began to be introduced to the theories of that man named Darwin. And, throughout the latter half of the last century, this explosive situation persisted - brought up on Christ and weaned from him by Darwin. Can you imagine the impact? No longer could Man be regarded as an "immortal soul," or a creature of the utmost "rationality" - of almost a divine nature. Then, for the first time in history, Man was reduced to the animal realm - made of physical "stuff" and forced to realize his "place" in this world. Human-kind's kindergarten had expired, leaving him quite alone and adrift in a *very* strange and hostile universe - where no loving "God" looked out for him, cared for him, loved him . . . It must have been very difficult. Now, however, we have a buffer called Existentialism, which has worked to numb us of the problem that confronted the people of the latter 19th century. At *that*

time, it would have been a very acute issue to deal with. And, simply, what happened was that people got physically "sick" - but, without any physical or mechanical cause. The effects were real enough, but no "causes" could be found. These conditions "selected" or "called out" of the culture, a medical doctor, specializing in neurophysiology, called Freud.

Now, I want to point out that the discussion I am presenting in this section is *purely* speculation, but it is not critical to the overall treatise. Freud's "treatment" was one he stumbled on, called the "talking cure". The patients Freud saw were not manifesting the symptoms of "schizophrenia," or "possession," as it had been called since the Inquisition. The symptoms were localized and far less severe - and the "disease" had been termed "hysteria," or the problem of the "wandering womb." A caricature of Freud's approach is as follows. Begin a patient on a three-hour to five-hour-per-week schedule of lying on a couch in a darkened room. The patient is told to talk about himself or what is bothering him or her. This is not a normal state of affairs, and one would be hesitant to talk about personal issues, so one would begin talking about many unimportant items. Freud engages a process of differential reinforcement of his patient's verbal behavior (though he was not aware of what he was really doing). Statements of little interest to Freud would receive no response from the doctor, and they would eventually extinguish. It would be a good guess to assume that Freud was particularly "interested in" (or, reinforced by) talk about sexual matters. Eventually, Freud would have succeeded in extinguishing all a-sexual talk by the patients, who being quite frustrated at the lack of progress in engaging the man, may have decided to prick his interest by a little sexual remark. Once emitted, it is possible that such initial sexual comments were reinforced by Freud, which leads to much more of the same. My point here is that it may have been Freud's "interest" in sex, that short-circuited revealing what was actually at the basis of the problem of his patients. If Freud reinforced them for talking on this level, they would do so, and his theories would show this color - which they do. But, if the nature of the problems were really having to do with Darwin, science's new picture of man, the necessary decline of religion's believability, and, at bottom, fear of the new issue of death and dying in a material world, Freud could not have been able to demonstrate this. However, his followers, especially Rank and Jung, were quick to break from Freud's pan-sexuality, and offer their own assessment of what was occurring in such patients. And, their theories deal directly with the failure of religion and the concerns of death. It is often said that to see the real nature or trouble of a culture, one needs to look at the arts. I remind you that the literature of the time was assuming a remarkable new form (Existentialism) as a kind of limited evidence supporting my interpretation. I should like to address the issue of the connection of Existentialist literature with the philosophy of the time, but it would really be a side route.

To place this section into a statement, religious beliefs of the latter 19th century were rendered untenable by Darwin and the rise of a mechanistic science, and the shock lead to avoidance behaviors which were called "hysteria." Freud interpreted these responses as sexually motivated, and then proceeded to present us with an "analysis" of what was occurring. And, the major point here, Freud presented another version of dualism as an "explanation" of the

phenomenon. He was remarkable insofar as he had a real point - that all behavior is not consciously caused or chosen by those acting. He invented the "unconscious mind." The problem was that he described the dynamics of the behavior in terms of a mentalistic interpretation - i.e., a story about creatures of the "mind" which interacted to then produce behavior on the part of the person. I call this "mentalistic" and I invoke Freud as a villain only because his story became *so* influential in the verbal behavior of nearly all members of our verbal community when they talk about the behavior of people. So, Freud is relevant here because of his mentalistic influence, against which Skinner has had to fight for his point of view.

What I have attempted to show is how two of the major thrusts of American psychology, psychoanalysis and methodological behaviorism have come to naught-insofar as they have re-engaged mentalism or idealism in their attempts to deal with behavior (the first of people, the second of rats). The "Third Force" of American psychology, "Humanistic" psychology, will emerge in the 1950's as a truncated, confused mixture of religion, social relationships and "meaning", which has no "meaning" at all as a part of a science of behavior. The only movement left without the idealistic blemish would be that of mechanistic materialism - the science of Newton, et al. But, alas, even this must fail; and it does during the first three decades of the present century. As "new" thinking arises, the "old" thinking will, in reaction, attempt to re-entrench itself. Religion, the old thesis, was confronted by Darwin and mechanistic materialism (Newtonian science), the new antithesis. Freud and psychoanalysis were the resulting "pseudo-synthesis," and it did not work, as we see after 50 years. We had not yet arrived at the point of synthesis - at least in psychology - during Freud's prime. This point may have been achieved for physics by Einstein. For biology, the point was reached by the thought of Darwin. But, for psychology, we are without a champion of synthesis - until Skinner.

We have one more issue to address before getting to B.F. Skinner. The "death throes" of mechanistic materialism produced in both the U.S. and Europe, in both physics and philosophy, a strange creature indeed. We have been introduced to it previously, and it is called "Logical Positivism."

The Three Arms of "Positivism"

As noted before, it is absolutely essential to avoid mistakes to take care to be clear about what one is referring to when using the term "Positivism." Auguste Comte, the French philosopher often held to be the father of Sociology, first used the term "philosophie positive" during the middle of the 19th century. His position was that of a social positivism. By this he meant that the basic data were of a social nature, and that no true psychology of the individual was possible, since all that can be studied is the behavior of men in social groups. He rejected Wundt's and Titchener's introspection as a source of basic indisputable information. I called this form "good," meaning that it was the least problem-ridden. Skinner comes close to this position in his analysis of how the verbal community shapes up self-knowledge in individuals through differential reinforcement of tacting of private events. However, Comte's position is far too extreme, for the individual *does* have direct and immediate access to his own private events, and he must "introspect" (in a vague sense) when describing such events. Skinner's only

limitation on self-knowledge is that the verbal community must use public (thereby, not wholly reliable) accompaniments of private events to differentially reinforce statements of self-knowledge. But, the restriction is on the verbal community - not upon an individual's access to his private events. For Skinner, people describe private events - that is given in the data, the verbal behavior. The problem is to account for the shaping of such behavior.

I also mentioned the "Positivism" of Mach, Avenarius and Pearson (England). This form was introduced in 1886 by Mach's *Analyse der Empfindungen*. The move was to completely circumvent any reference to what was metaphysical (unobservable). Forgive me if I seem to give this school of thought short shrift; however, it is an absurd position for any scientist to assume. In their concern to avoid any metaphysical "objects" or statements about such "objects," they were led to doubt that they really had access to the real physical world. All they could be sure of is their access to their own sensations which, we believe, reflect the material realm. Therefore, it was only possible to speak of those sense data - and nothing else. The material world was, for them, a metaphysical object. One is tempted to ask them how they "knew" they had access to sense data - since, for Skinner, one learns to speak about private events (or to speak at all) by means of the reinforcing practices of the verbal community. To assume that sense data copy the world, and then to retreat to the position of doubting that this material world even exists at all, is to re-adopt, at best, a weak Cartesian position. One might also liken them to Kant - had he been plagued with doubts about the existence of the "noumenal" realm. At worst, this position is simply a very uneconomical method of attempting to assert a pure subjective idealism, poorly distinguished from solipsism. In doing science, one is asked to make very few assumptions. One you are asked to make is an easy one - to assume that the world is real and that the business of science is to attempt to learn to describe it in more and more accurate and precise terms. In other words, if a scientist cannot admit to being a materialist, he admits to being a very poor philosopher. So, it is not difficult to imagine why this Machian Positivism never "got off the ground" (it was never "on the ground" to start).

Finally, there arose a third "positivism," during the third decade of this century. However, I again wish to be precise in my terminology and to discriminate between "Logical Positivism" and "Operationalism," though they are often lumped together as one movement. Logical Positivism is a product of European philosophers, known as the "Vienna Circle," including Rudolph Carnap, A.J. Ayers, Herbert Feigl, A.E. Blumberg, Philipp Frank, Otto Neurath, Hans Hahn, Moritz Schlick, among others. Also associated with the group were Ludwig Wittgenstein and Karl Popper. I will be brutally simplistic and say that these were men who got caught up in their own verbal behavior - more precisely - in the grammar of language. Somehow, they came to consider the logical relationships in the grammar of statements about the world to be more basic than the world about which such statements are made. Or, in other words, they seemed to believe that the only door to the world was through a pure logical analysis of statements about the world. They reached this situation because of an attempt to reintroduce the positivism of Mach with the work of Poincare, so they inherited Mach's distrust of the world. Some seemed to follow Mach into regarding the sense data as somehow sacrosanct:

... it seems advisable always to speak of the "occurrence" of sense-contents and sense-experiences in preference to speaking of their "existence", and so to avoid the danger of treating sense-contents as if they were material things.

The answer to the question whether sense-contents are mental or physical is that they are neither; or rather, that the distinction between what is mental and what is physical does not apply to sense-contents. It applies only to objects which are logical constructions out of them. (Ayer) (7)

It is clear from this that Ayer could not be called a materialist. But, how does one proceed from sense-contents to the "logical constructions out of them?" One can only do so by examining the logic (or, grammar) of the propositions made about the sense-contents. Primacy is given to logic, but, how allowable is this move? An entire British school of philosophy (ordinary language analysis) has grown up with this assumption; however, the only thinker to subject even language behavior, itself, to a scientific (though not yet empirical) analysis is B.F. Skinner - and he would not agree to this attempt to make grammar or logic primary to a scientific investigation. Let me offer an example of how Skinner's analysis of verbal behavior leads to quite different conclusions than those of a logician. In logic, if one makes two propositions - "A" and "not-A" - one relies on a form of set theory, using the principle of exclusion. The first proposition is a set of all things belonging to category or label "A". "Not-A" is a set including all things exclusive of "A". Further, to propose a set "A" one logically implies an exclusive set "not-A", unless "A" proposes the characteristic of "existence", which then leads to what I consider ridiculous logical contortions. If one, instead, follows Skinner's lead in analyzing verbal behavior as behavior, a very different situation transpires. Skinner treats negation ("no" or "not") as a qualifying autoclitc - or a verbal operant which serves to modify the over-all effect upon the listener of a larger operant unit within which the autoclitc occurs. (8.) In our example, a speaker will state "A", when confronted with a certain range of stimuli configurations, provided his verbal community has reinforced stating "A" in the presence of such a range of circumstances. He will state "A" throughout this range, and he may even generalize to circumstances beyond the reinforced range, stating "A". At the vague limits of such ranges, he may, depending upon his history, utilize other autoclitcs, such as "A-like" or "somewhat similar to A". If the circumstances were far enough removed from the range of circumstances within which he was differentially reinforced for "A", he may emit "somewhat like B", or "B", or possibly "I don't know". We would not encounter "not-A" unless he had received some specific shaping by the community. The autoclitc "not" will occur when the speaker is in a situation in which stating "A" is highly probable, but the community has shaped a discrimination (based upon small, but important differences to that community) between this new circumstance and others which occasion "A". So, in such a circumstance, though the person is inclined to tact "A" editing will occur to yield "not-A". In teaching a child proper color-talk, the verbal community will reinforce "red" in response to a wide array of electromagnetic frequencies. As the child matures, it may become important to the parents to instill more subtle discriminations of color. A child is shown a ball and given the mand "What color?" He generalizes to the new situation, and asserts/tacts "red." The parents respond "No, not

red." In future instances, when shown the ball, the child (because of his early training) is still likely to say "red", but the parental discrimination training leads to the autoclitic "no" - and he says "not-red". If the parents have provided an alternative tact, such as "No. Not red - it is orange," the child may produce the new tact, or he may just say "not red". But, additional shaping will result in a new color-tact "orange." In situational ranges involving more complex discriminations than just the use of color tacts, the more precise tact may not be supplied, and the use of the autoclitic "not" may remain in force.

The point of this tedious discussion is to demonstrate just one difference between a logician's or philosopher's treatment of the behavior of negation and Skinner's understanding of the process. For the logician "A" and "not-A" are mutually exclusive categories of an almost *a priori* nature. With Skinner's analysis, the entire logical exercise evaporates as verbal behavior is understood as more behavior to be analyzed. For Skinner, "A" and "not-A" do not imply mutually exclusive logical categories - they involve very *similar* stimulus configurations presented in the material world. So, the power of the logician's concern with the "logic of propositions" disappears, and with it goes the importance or the need for the Logical Positivists' concern over such logic in scientific statements. The Logical Positivist, with their lack of understanding of verbal behavior, took their own far too seriously and turned themselves into flagrant subjective idealists. If one does not understand the real causes of one's verbal behavior, one can place too much importance upon it or its structure, and thereby lose all touch with reality.

Now, after all of that, I will grant to you that a "logical analysis" certainly seems to be an easier task than a Skinnerian analysis of verbal behavior. But, I remind you that the rendering of on-the-spot idealistic "explanations" or mentalistic "stories" about material phenomena is always a simpler task than to have to deal with the reality of the material world. But, Skinner would not claim to aspire to being more simple, just a bit more correct. This task might begin to become more easily accomplished if we practiced a rigorous materialistic approach, and ceased attempting to escape our difficulties by launching ourselves into such easily spun idealistic "explanations" of our behavior and the rest of the material world.

We acquire our verbal behavior about the world - from outside, so to speak. To assume that it is, somehow, a primary datum, accruing from within, is - despite all of the possible verbal contortions to the contrary - to yield to subjective idealism. So, despite Boring's characterizations of Feigl's logical or operational positivism as "an attempt to get back to basic data and thus to increase agreement and diminish the misunderstandings that come about from unsuspected differences in meanings," (9) it is just idealism - and of no use to science. The Principle of Verification has nothing to do with empirical replication of scientific results; it becomes a matter of philosophers agreeing on what they "mean" by what they call "scientific" propositions, based upon their subjective sense data. This is harsh, but fairly accurate.

We see idealism, dualism or mentalism creeping into science continuously, during the period from roughly 1850-1940. Freud gave us a glaring mentalism. Though cast as a man of science, he was a physician, and unfamiliar with the issues we now engage. Hull and the other methodological behaviorists assumed they were being quite scientific with

their reliance upon the hypothetico-deductive method of theorizing. Though they were studying behavior, in their ignorance of the subject matter, they lapsed into a verification of an imaginary conceptual nervous system or an invented physiology - which is nothing more than an idealistic "story" parading in scientific terminology. The Logical Positivists, despite their philosophical sophistication and their overwhelming concern not to fall into metaphysics, did fall into a kind of mentalistic metaphysics, by placing their emphasis on sense data and logical analysis of talk about those sense data. But, they had no way of knowing, at the time, that their very talk would succumb to a scientific analysis. It would be fair to say that, at least, *certain* portions of science were breaking down between 1900 and 1930 - especially psychology and physics. Other aspects of science were doing quite well, such as biology. When a science falters, idealism rushes in to fill the explanatory void left by initial materialistic explanations which had failed. I will say here that it was not a materialistic science that had failed-in all cases of idealistic influx. Rather, it was the explanatory paradigm of certain sciences that had failed to accommodate material phenomena taken under consideration. A "paradigm" is a method or design of explanation. The paradigm we will see falling is that of Newton and the mechanistic materialists. This does not impugn science or a materialistic position. It brings habits of investigation and presuppositions under re-examination. The problems encountered by physics (the "Queen" and most emulated of the sciences) during the first three decades of this century are well known to scientists and philosophers of this time. In glib terms, the 4000-year-old concept of Atomism was finally forced, by scientific advances, to "stand still" for a "face lift." In 1905, Einstein published three papers that rattled physics to its bones, or its "atoms". We do not need to go into these papers, here, except to say that they toppled the Newtonian paradigm out of physical research, and put it into mundane technological applications. In one sweep of the pen, Einstein reduced Newton's "cause-and-effect" mechanical world into "simply" a first approximation of a description of the material world.

Of course, it was not simply Einstein's articles that led to the coming of revolution in science, which culminated in the replacement of the "If-then"/"Cause-effect"/"S-R" paradigm. Scientists, demonstrating the "I'm from Missouri" point of view, continued in an attempt to reaffirm the old paradigm by their research - this was specifically true in physics. They had reached the atom, which was still a useful concept for chemistry, but in reaching more deeply into the material organization of the world, they began to be overwhelmed. Studies of the behavior of electrons confirmed that light quanta could be, rather, *had* to be jointly described as particle and wave. Sub-atomic particle studies revealed that particulate physics was indeed in trouble-in fact, so was the classical model of atomic physics, that matter was just an accumulation of indivisible little "pieces of some basic stuff." Einstein had stated that "matter" and "energy" were not basic distinctions, that they were really only patterns of behavior or action of some more basic kind of material. Now, their own research supported Einstein's contention. After the 1930's, physicists began to learn to live and work with this kind of contradiction. But, as always, just before such a maturation, idealism gets thrust out as an attempt at saving the old methodology. In 1927, a Harvard physicist, Percy Bridgman, published a book, *The Logic of*

Modern Physics, which introduced the notion of "Operationism". The reasons I include Operationism here are: (1) it became quickly assimilated into the Logical Positivist movement, (2) it was written for physicists, but appealed to psychologists of the time, and (3) it is a reflection of the kind of thinking that would have a large influence on American scientists of that time - Pragmatism. One might even venture so far as to suggest that Bridgman had been swayed by the Pragmatism of William James. In attempting to handle the state of utter disarray in physics because of Einstein's Relativity Theory, Bridgman proclaimed that the concepts of physics should only be defined by the techniques of measurement (observational operations) by which they are established or "observed." Put a little differently, any "objective" event or object in the material world is comprised of nothing more than the operations - *is* nothing more than these operations - by which it is observed or measured. Clearly, the move subordinates the material world to the thinking or acting of the physicist. The material world, somehow, cannot be gotten to - it is only a postulation of the physicist. We can know reality as it is presented in our sense-contents, and in this way only. Bridgman never took the argument this far; however, it is clear why we now see Logical Positivism and Operationism as almost identical. The move is quite clear - when reality confuses us by its complexity, we always attempt to deal with the complexity by falling back upon our own mentality as a source of the "observed" busy-ness of the world. The world is, after all, very simple (comprised of just cause and effect - of balls bouncing off balls), and if complexity is seen, it must arise from our seeing of the world. Or, we must invent the world that we see, because given the supposed simplicity of a real world, any complexity is our offering. But, any move to subordinate the material world to human mentality is just a re-introduction of idealism. We don't create the world, it created/generated us; and, we don't project complexity onto it, we sometimes can learn to discriminate, because of complex contingencies, the complexity inherent in the world. This last statement has never been taken seriously in the U.S. by anyone except B.F. Skinner and those who have read and understood his works.

Boring, in his assessment of Skinner, went so far as to include him within the Operationists: "He was certainly a practising operationalist all along even when not a participant in a common concern." (10) This may very well be an accurate statement about the young Skinner, as a graduate student. After all, he was at Harvard during the time Bridgman was issuing Operationism. It may even be true of Skinner during the period after graduation, for the influence of one's verbal community is a lingering matter. But, Skinner is not an idealist. His entire career, between 1938 and 1955, was spent in the laboratory, confronted with the real world (of course, he worked with rats and pigeons, which seems questionable, at first - but, because of his behavioral subject matter, he was *never* led to the kind of confusing complexity which usually results in a re-introduction of idealism). It was because of Skinner's early work with "simple" animal subjects that he was able to understand the need for a paradigmatic revolution in science. Once those studies were finished, and once he had a grasp of the material processes underlying the behavior of "simple" organisms, he was able to turn his new understanding of behavioral processes to an analysis of man, himself. He eschewed idealistic/mentalistic "explanations" so strongly, that he was able to bring about another portion of the paradigmatic

revolution in science. This portion was the most important of all - it was in psychology - in the study of mankind, itself. Before we could expect any other scientist to adopt a *truly* materialist approach to his subject matter, a science of scientific verbal behavior in the human species had to be developed. And, such a study was begun, by Skinner. With Skinner, we are, at last, freed from idealism as a retreat from social progress.

We are about to turn to Skinner, however, there is one more item to deal with before we can enjoy that change. I mentioned William James earlier, in conjunction with the American form of psychology called "Functionalism". Watson rejected both "Functionalism" and the other American school - "Structuralism" - because both were enthralled with "consciousness". Watson, adopting the model of Pavlov, tried to place American psychology on a scientific basis. Pavlov's study was in physiology, dealing with reflexive behavior. It was an absolutely "cause-effect" description of behavior - which worked well for reflexes, but could not deal with the full panorama of the behavior of organisms. The result was an eventual retreat into mentalism by later methodological psychologists. Skinner broke from this trend at the onset of his work. But, like all workers, he was influenced by some of those going before. He did retain the concepts of the stimulus and the response from the Pavlov-Watson line, and he also seems to be affected by Franz Brentano's "intentionality". But, some believe he was further responding to the work of William James. After all, Skinner does talk about "functional relationships" and James represented "Functionalism". James was totally taken by the work of Darwin, as is Skinner. However, James is best known as one of the originators of "Pragmatism," but I cannot see Skinner following James down this particular path. Behavior modification is the best known technological application of Skinner's writings, and the best known motto of "B-mod" practitioners is "It works!" (the implication is therefore, it must be right). In this sense, some of Skinner's technological followers are rather Jamesian. For, the best known motto of Pragmatism is something like "if it succeeds, it is 'truth'." I want here to definitely draw a line between what Skinner "means," and what "the B-mod Squad" states in their enthusiasm for their success. An important point of the current movement in Radical Behaviorism is to distinguish itself from "pragmatic" applications of its "Truth". Pragmatism asserts that *anything*, any philosophy or position that produces "results" is a "truthful" point of view. Unfortunately, what James overlooked, despite his good intentions, is that the power to generate "results" that someone is likely to call "good" always resides in the hands of those who have the economic "power" in any social system. They will define the "good" or the "truth" as it best suits their own ends. Plato defined his idealistic notion of the "good" in terms of his religious "consciousness." Modern Capitalism defines "good" in terms of the profit margins of its adherents. Idealism has gone woefully astray once again. But James was at first concerned with analyzing the function of consciousness with regard to its function in the survival of conscious beings. This is not a bad question for one engaged in scientific research - "consciousness" is, certainly, an important item to "understand" scientifically. James *was* correct in that matter, but when he lost materialism and opted for mentalism, he erred badly.

To illustrate the problem I have with James, I will call out someone who is basically on his side of the fence - Lord

Bertrand Russell:

What he (James) is denying might be put crudely as the view that consciousness is a "thing". He holds that there is "only one primal stuff or material," out of which everything in the world is composed. This stuff he calls "pure experience." Knowing, he says, is a particular sort of relation between the two portions of pure experience. (11)

Russell continues to demonstrate that this "pure experience" is really just a "neutral monism." We understand a "neutral monism" to mean something like what comes out of modern sub-atomic physics - i.e., a realization that the separation of matter and energy is a false doctrine that is inherited from mechanistic materialism. But, this interpretation of a "neutral monism" is not at all the intention James had for his readers' understanding of his words, as Russell points out:

James himself did not develop this implication of his theory; on the contrary, his use of the phrase "pure experience" points to a perhaps unconscious Berkeleyan idealism. (12)

It seems that Russell has caught James with his philosophical trousers down. If, even Lord Russell, who through Wittgenstein is loosely tied to the Logical Positivist's (besides his endorsement of the Logical Atomistic theory of language), resorts to labeling James a Berkeleyan idealist, my case against Pragmatism should stand without question. But, Russell is wont to go even further in his impugning of James, though - thankfully - without resorting to Freudian explanations, popular in 1945:

... James is concerned primarily with religion and morals. Roughly speaking, he is prepared to advocate any doctrine which tends to make people virtuous and happy; if it does so, it is "true" in the sense in which he uses that word. (13)

It is revealing, indeed, that James is willing to support "any" doctrine that makes people "virtuous" and "happy." Of course, "virtuous" remains for James to define, according to his preferences, or to his "interests." "Happy" is also his to delineate. I would presume that for James a "happy" person is one who does not act against his best interests, for non-action is a form of consent. James backs "any" doctrine producing such results (but, how does he know such results, since he has only access to his "experience?"), but we know the "doctrine" that James and those of his class probably supported at the turn of the century. To be brutal about the matter, "truth" for William James must be whatever doctrine maintained his well being and station. In other words, Pragmatism is no doctrine at all, for it is any philosophy in any society that maintains the status quo for those in such a position to engage in writing philosophy. One further statement by Russell will suffice:

(James) wants people to be happy, and if belief in God makes them happy let them believe in Him. . . James' doctrine is an attempt to build a superstructure of belief upon a foundation of scepticism, and like all such attempts it is dependent on fallacies. In his case the fallacies spring from an attempt to ignore all extra-human facts. Berkeleyan idealism combined with scepticism causes him to substitute belief in God for God, and to pretend that this will do just as well. But this is only a form of the subjectivistic madness which is characteristic of most modern philosophy. 14

Goodness be! It appears that Lord Russell is doing my work

for me. Talk about "God" versus "a belief in God" I will defer to Philosophy 1A. Perhaps Russell is miffed at James, because his Pragmatism may lead him so far as to suggest that a "belief in mathematics" would suffice for mathematics, itself. But, this would further lead us to believe that, perhaps, Russell still clung to a belief in Euclid, not having taken Einstein seriously when he demonstrated that Euclidean geometry is no absolute, but simply a way of describing the "space" within which material transactions occur. However, what is clear from this is that much of science at the turn of the century was infused with mentalism or, if you will, idealism.

The key element of understanding missing from all of the philosophical debating we have, thus far, stood patiently enduring is that man, himself, and all of his talk/philosophy is just as much a product of the activity of the material world as everything of which the talking was about.

Thus far, I have often talked about paradigms and a paradigmatic change or revolution, and I have successfully avoided directly discussing this issue. However, it is now necessary to do so.

The Paradigmatic Revolution in Science

If one reflects upon the history of the thinking of our species, as it has been outlined thus far in the article, the dialectic process is clearly in effect. We have been in the process of learning more and more effective ways of describing the world we inhabit. Theology, the early method of description, yielded a number of forms of idealism in philosophy. This move can be called the "thesis." The "antithesis" to idealism is materialism, which was brought to the front by Newton in his notion of the "If-then," "cause-effect" and, finally specialized as "Stimulus-response" psychology by Pavlov, Watson, Hull, et al. In physics, the act of specialization was achieved by the Logical Positivists and the Pragmatists (including Bridgman's Operationism). All of these modern reactions to the failure of the first materialist approximation to talking about the world (the "cause-effect" or "S-R" approach), leads their originators to assume idealistic "bandages" to patch up the problems inherent in that form of description. The resolution, or the "synthesis" of these divergent lines of thinking, I call the revolution in science - the turn of the paradigm. The ignored seeds occurred early in our history, (before Plato) but the effective growth of the movement, in modern times, began with Darwin in the science of biology. Quickly, Karl Marx followed with this thought in economics, sociology and "culturology." In physics, the move was decisively made by Albert Einstein. Finally, this somewhat unorchestrated revolution in thinking erupted in our own back yard - psychology. Though the real effects of his work have taken decades to develop, B.F. Skinner carried this paradigmatic revolution into psychology in the late 30's.

But exactly what was involved in this change? I would generally classify three basic modifications in approach. First, there is an absolute re-commitment to a rigorous materialism, or, to put another way, there was a complete disavowal of any attempt to introduce idealistic or mentalistic "variables" in the description of material phenomena. Secondly, there was a definite move away from Newton's practice of looking at "point centers" of action. Material phenomena were regarded as related to the surrounding environment in a way Newton had not conceived. "Point centers" gave way to a "field" interpretation, and the space dimension of material

interaction was greatly enlarged. With Einstein's treatment of time as part of the space-time continuum perhaps it was easier for Skinner to pay attention to what transpired after the response in the "stimulus-response" paradigm (i.e., the consequences), without fearing that he was relapsing into a kind of Aristotelian teleological causation. For Skinner the "point center" stimulus as a "goad" or reflex initiator is replaced by stimulus as an occasion for a discriminative response, and stimulus as a reinforcing state of affairs transpiring in the environment, as a result of a discriminated response. Thus, we have Skinner's statement of the contingencies of reinforcement as a description of the functional relationships between an organism and its environment. Symbolically, Skinner replaces the S-R paradigm with the $S^D \rightarrow R \rightarrow S^R$ paradigm, which appears to be of little significance to many, but which bears a profound significance if one can see it as a part of the revolution against the Newtonian way of thinking.

The third characteristic of the revolution in thought is that the notion of "history" takes on importance as a source of variables useful in fully describing a material process. History is obviously important to Marx in his analysis of social evolution. For Darwin, the history of the species is represented by the form of currently living organisms. Through genetics and structure, Darwin rendered history as material. Freud had an inkling of this notion of the importance of history, but he was too heavily influenced by Newton to see the variable as material. Newton viewed "action at a distance" as some mysterious "force" acting on his "point centers," which existed within an absolute space (at a definite location). Newton regarded time as an absolute unfolding of events from the past to the future. Newton called his strange "force" gravity, and Freud had to deal with this. A person's distant past he observed to have an effect upon present behavior - but this appeared to be "action at a temporal distance." A Newtonian thinker could only handle such a proposition by resorting to some mysterious force, and as Newton had glued together events occurring at a distance with "gravity," Freud connected events acting at temporal distance by the "unconscious mind." So, the Newtonian "gravity" (action at a spatial distance) and the Freudian "unconscious" (action at a temporal distance) have the same ontological status as explanatory fictions. After Einstein and Skinner, both concepts are exposed for what they are. Gravity becomes a characteristic of a material space-time continuum, and the unconscious becomes the observed effects of a material modification of the structure on the organism.

Einstein's thought has been somewhat vindicated by the developments of modern physics. However, old ways are reluctantly dropped; and, some modern researchers in elementary particles have opted to discuss their work in terms of the interaction of the objective processes and the consciousness of the observer, which reminds one of Logical Positivism and Pragmatism ("sense data" and "experience"). Such a move richly smacks of idealism, again. Other workers in the same field discuss their research in terms that seem to reach back to the Newtonian scheme of "point centers" of action. They attempt to salvage the integrity of the sub-atomic particles by speaking of "attractive forces" as exchanges among these particles of smaller particles. The names of these smaller particles of exchange are clearly determined by the nature of the "forces" they are supposed to explain or by a metaphorical extension that illustrates what the "forces" accomplish - respectively.

"gravitons" and "glueons" (an exchange of gravitons explains gravity, and an exchange of glueons explains how three quarks are glued together to yield a proton). It seems that sub-atomic physics has got more work to do before the revolution to Einstein is completed.

In psychology, Skinner's work has been recently vindicated, by work we are all familiar with. But, he is also plagued by moves in reactionary directions toward idealism or mechanistic materialism. I have already mentioned cognitive psychology, which is a curious combination of both idealism and mechanistic materialism. There is humanistic psychology, mentioned before, which is hopelessly idealistic. A purely mechanistic psychology is currently rare, however, the work of Dollard and Miller provides at least one example, since it seems to be a return to Pavlovian thinking - admittedly contaminated with some Hullian concepts.

The reason I find B.F. Skinner so vitally important to modern thought is because he is purely a product of this revolution. He alone in psychology, has resisted the temptation to regress to the traditional modes of thinking. He has maintained the only true scientific approach by simply observing the effects of independent variables upon the dependent variable, behavior. What he observed has resulted in causing him to say some astounding things about human behavior - especially in this culture. The man is pregnant with novel insights about human behavior, yet the cultural inertia with regard to new concepts of human nature in the West has, so far, mitigated against his general acceptance.

Skinner's thought, I maintain, truly produces the bedrock of a revolution in this culture - not just in psychology, but within the very foundations of social institutions. His work completely undermines the philosophy behind prisons and mental health institutions - even our basic understanding of criminal behavior and "mental illness." He challenges, with great promise, our notions of human freedom and dignity. He threatens to overturn the economic basis of our society. He does not just point out the ills of capitalism, he explains why this system is "sick." Today, there is no man who speaks with greater power to the "free" capitalistic world, about the way to a constructive revolution of social practices.

Of the four great modern thinkers I align with social and scientific revolution, only one, Charles Darwin, is almost completely accepted - simply because he dealt with an innocuous area, "dumb" creatures. Marx (and Engels and Lenin) dealt with the social system of economics and the distribution of wealth. This is a far less popular area of change, so change as a result of their works is limited to non-capitalistic areas of the world. Einstein is, thus far, somewhat misunderstood - or not, understandable - by physicists. And B.F. Skinner has to deal with a "cultural inertia," a product of our capitalistic system, so, he is not widely accepted here.

Before I move into discussing only Skinner, I want to stay with this so-called revolution in scientific thought and to contrast the move with what I call "Newton's world." As I have stipulated before, Newton's "cause-effect" paradigm was a mechanical metaphor, borrowed from the operation of clocks (or from the dynamics of a billiard or marble game). And, it served us well for 200 years as a first approximation toward an accurate description of the operation of the world. I grant Newton his success, yet I want to view the area within which it applies - closely enough to be useful - as a circle, enclosing most material processes. The center of the

circle is comprised of such events as Newton described, while the perimeter of the circle represents a level of structural complexity at which Newton's descriptions break down altogether. The radii of the circle represent increasing structural complexities (toward the boundary) of any number of qualities of complexity. So, as one progresses outward, along any radial line, Newton's mechanics become less and less descriptive, thus requiring additional descriptive approximations. Therefore, though Newton applies centrally, the further one travels distally along any radius, a new paradigm is an increasingly more pressing need; and, if one has clutched the "cause-effect" paradigm throughout the journey, one can either accept a new paradigm, or bolster the old one with idealistic explanatory fictions. But eventually, if science is to progress, a paradigmatic shift in descriptive practices must occur - the "must-occur" points lie on the circle's perimeter. Suppose one adopts the radius, "speed." At points approaching the speed of light, the paradigmatic shift occurs, as it did with Einstein. If one selects the radius of material "smallness," one is lead to modify "atomism" to include sub-atomic particles, and eventually to talk of the smallest particulate "events" - the "quarks." Finally, the point is reached at which there is talk of the observer's "consciousness" (a retreat to idealism), or talk of even smaller particulate exchanges that *must* occur at or near the speed of light. Here, again, Newton has failed us - and a change is required, though, we have yet to see what it may be.

Suppose the radius you select is that of simple formal complexity of structure. At first, Newtonian description seems to be comfortable, as we deal with the behavior of atoms, then molecules, and even with that of large bodies of matter - such as marbles, planets and, perhaps, mountains and rivers of water. But, eventually, as we traverse this radius, we will encounter the virus, bacterium and the "living" cell. Newton will fail us again, for we seem to want to call the behavior of such entities "different" than what we had previously encountered. We even invented a term to signify this difference in behavior: "animate" as opposed to "inanimate." And, this difference in labels seems to be of great importance, because we now talk of "life," as some special "force". Yet, our verbal discrimination really tells us only one thing - this *stuff* behaves differently than we observe planets and mountains to behave. We coin the term "living" or "animate", but all we can say is Newton's description no longer applies - cause and effect doesn't tell the entire tale. It doesn't fully account for what we observe. If one continues along such a radius of structural complexity, one will be faced with explaining the behavior of creatures capable of a real quantum jump in complexity - those which can talk. At this point, if one clings to Newton, all manner of idealistic talk will occur. At this extremely removed position from the comfortable center of Newton's world, we encounter ourselves. And a "science" of description, based upon mechanics and idealism, will either attempt to remain mechanistic (by introducing pseudo-physiological explanatory fictions, and becoming idealistic), or it will openly embrace the old idealism, and talk of the "mind", and "free will", and "human dignity". Newton has failed us, and so we adopt other descriptions. The trouble with such a move is that it always involves a move back to idealistic talk - unless there occurs a truly *paradigmatic* shift. There is, however, a considerable problem with idealistic talk. It always serves to support those with the money to fund continuations of such research and talk. In other words, an

idealistic "science" is always a handmaiden to the monied class. With thanks to Skinner, I see his psychology as an actual step beyond capitalistic economic greed. He has made the paradigmatic shift to new descriptions of human behavior. Skinner alone in psychology has been able to retain a real scientific stance. He, alone, describes us as we are; and, in doing so, he has given us a new and unfettered materialism. And, accordingly, he joins the ranks of Darwin, Marx and Einstein in re-asserting *science* as the most hopeful action we could adopt.

In summary, this paradigmatic revolution in science is based upon three new developments. There was a re-affirmation of a sweeping materialism, designed to *actively* exclude further attempts to slip back into idealistic modes of explanation. Darwin excised the possibility of Divine action within the evolution of a natural world. Marx violently bridled at any hint of idealism, claiming it was a device of the privileged class aimed at preventing scientific progress, which might threaten their stations and free all people from economic oppression. Einstein redefined "matter", "energy", "space", and "time", in order to prevent the Newtonian notions of particle, force, absolute space and time as a one-way river divorced from material processes and the space they define. And, of course, there is Skinner's complete ban on any form of mentalistic descriptions of behavioral events. Secondly, the revolution embraced the rejection of Newton's "point centers" of action. For Darwin, changes in a species involved the selective actions of the environment. For Marx, individual consciousness which might lead to revolutionary action is to be explained by the cultural conditions, which give rise to changes of - or states of - consciousness in individuals. For Einstein, the physical processes which lead us to infer the existence of particles are more directly approached as related series of events occurring within a region of the space-time continuum. For Skinner, obviously, the behavior of individuals must be explained in terms of the effects of the physical and social environments. Finally, the revolution in science stressed a sense of history'. Darwin stated that a species is, at any moment, a result of a long evolutionary history, preserved in the genetic code, which is passed from generation to generation. Marx founded his descriptions of the development of society squarely upon a history of progression from slavery to feudalism to capitalism (via industrial revolution), then through social revolution to socialism, which finally culminates in a true communism.

For Einstein, this sense of history is a bit more obscure, but it is present, none-the-less. Since historical "time" is usually understood in the Newtonian sense of an absolute one-way time flow, and since Einstein repudiates this notion of time, what use of any "history" has he? Just enough to save relativity theory from being made to serve Logical Positivism's ends. One must realize that Einstein was at deep odds with Newton's atomism of eternal, unchanging, indivisible and ultimate particles as a basic expression of materialism. Much as in S-R psychology, it was clear that an insistence upon such a description only resulted in idealistic excuses for definitional mistakes - ultimately, the material world does not present us with ultimate particles. This is *just* an empirical *fact*. So, the question should be asked, 'how does science deal with the world *beyond* what Positivism allows (sense data)?' Einstein's point was that what we infer to be particulate bodies is nothing more than a series of "events" that have been observed to occur in measurements we make. Now, this sounds very much like

“Operationalism,” and well it should, because Bridgman designed his view to “handle” Relativity Theory. But, Einstein was not laboring under Logical Positivism’s or Operationalism’s guidelines. For Einstein, the real material world was still there to be observed; he just insisted upon a new latitude of description. He wanted to speak of a series of events, as opposed to particulate bodies. For Einstein, a “particle” is best defined as a history of material events that are related, as we observe such events. A *history* of material/physical/actual/real (these discriminations did not plague Einstein’s thinking) “events” defines what Newton had simply referred to as a “particle”. But, we *observe* the world, in his thinking, we do not create it by our thoughts. The events we observe are real - what needs changing is not our metaphysical assumptions about the nature of what we see. We only need to shift our descriptions of what it is that we see, to account for the observed relativity of material events. So, for Einstein, “particulate-ness” is simply replaced by a “history of observed events”. For Skinner, it is quite obvious that he places great emphasis upon history. His emphasis of the ontogenetic history of reinforcement and the phylogenetic history of survival requires no further remark.

It should be clear that Skinner cannot be placed among the idealists, the mechanistic materialists, the Logical Positivists or the Pragmatists. I have left him classified as only one of a group of modern scientists, who have engaged a “revolution” in scientific thinking and methodology. These workers are all, basically, materialists, but only one has seen fit to coin a term for this neo-materialism-Karl Marx. His term is dialectical materialism. To ask if Skinner is a dialectical materialist is merely to ask if Skinner and Marx obtain compatible points of view - the name given the position is of minor importance, although Marx selected dialectical materialism because of a historical tie to Hegel and Plato. We will use Marx’s term, because he chose it in order to recognize a similarity in logic between himself and Hegel and Plato, but also to point to a fundamental break between his position and that of Hegel and Plato. The distinction is that Marx was a materialist, whereas Plato and Hegel were idealists - but that is common knowledge. The similarity was the notion that a “dialectical logic,” rather than a formal “Aristotelian logic,” was the correct method of analysis of material phenomena. We saw that Aristotle’s “If, Then” method led, ultimately, to Newton’s “cause-effect” materialism. This is a bit queer, given the biases of Aristotle and Plato. Of the two, it was Aristotle who was more the materialist, and who set the tone for the future development of science. Plato was a full-blown idealist, whose thinking set up western religiosity and the philosophy of dualism - yet Marx sees Plato as an intellectual predecessor of dialectical materialism. This is a tricky problem, but the answer lies in the primitiveness of Greek philosophy of the time. The more sophisticated in-fighting of the next 2000 years had no effect on that thought.

The dialectical issue revolves about a proper notion of evolution. Although Aristotle is often spoken of as the first real evolutionary thinker, because he objected to Plato’s idealistic causes and substituted development through successive changes toward an innate “potential,” his short-coming was just that stress of an *innateness*. Somehow, the “final cause” was *in* the developing entity, and it pulled it toward progress in the present from a future goal. This is teleology, a doctrine rejected by all scientists outright. Plato, on the other hand (though, a flaming

idealist) could *not* place the causes of evolutionary change within the changing entity-the source of such improvements *had* to reside beyond the developing entity (mentalism, remember, is a more recent doctrine). Plato had situated the source of change in the realm of the Forms; but, *at least*, that was *outside* of the organism. As science progresses, the gods are replaced by the action of the environment. Plato would have objected vehemently to a modern interpretation, if he could have understood such an interpretation at all - which is extremely doubtful. But, because mechanistic materialism had proven itself to be in error, by Marx’s lifetime, and because German idealism was in vogue at the time, mainly through Hegel’s and Kant’s work, it was not difficult for Marx to see a new methodology of a materialistic science in the idealistic dogma of Plato and Hegel. Bury the idealism, but borrow the logic of the beast - this was what Marx must have entertained as a way out of Newton’s mechanistic materialism. Marx must have recognized that, outside of the scope (or, circle) of “Newton’s world”, in the area of human social interaction, it is not the mechanistic, but the dialectical method of interpretation that will suffice to the task, first, of comprehending, and then of actually guiding the evolution of this society.

But, let me pose a simple question - “what, exactly, is the ‘dialectic’ process?” Many speak of it with a feeling of great familiarity, but when pressed to elaborate and offer examples of the process, they cannot. Some will speak of the development of a “thesis,” a state of affairs, which contain “seeds of its own negation”. They continue to say that the antagonistic interaction of the “thesis” and developed negative seeds, the “antithesis”, will produce an evolutionary advancement, containing the best of both, called the “synthesis”. In such cases, one can only sense that the answers are comprised of well-intentioned verbal behavior that is strongly under intraverbal control by the works of Marx; but, it is not contingency-shaped verbal behavior. The logic of dialectics is very simple - it is the application of dialectics that poses problems. Marx’s verbal behavior was certainly (to a large degree) contingency-shaped; but, because most of us are not exposed to contingencies similar to Marx’s time, the talk we engage in which topographically resembles Marx’s talk is simply intraverbally controlled by Marx’s talk. Intraverbal behavior “idles”, in the sense that it does not map onto the environment (the physical or social) within which it is observed. The issues Marx addressed, regarding the economics of a class society, still prevail, but for most of us, they are comfortably disguised. In a society like ours, the only exposure some of us can obtain to real revolutionary issues, are found in such esoteric battles as deciding what the true form of scientific thinking should be. It is this particular battle which I have spent so much energy herein addressing. And, what, after so much “revolution” in scientific thinking, has science discovered? I think we have just discovered the dialectic.

The last statement should, perhaps, be put a bit differently. After nearly 300 years, conditions have developed that allow us to recognize that much of the science of the last century, that breaking from Newtonian thinking and finally realizing the insidious ways in which idealism can creep into interpretation, is dialectical in nature. This is especially clear in the Skinnerian revolt against positivism and S-R psychology. His new paradigm for describing behavioral processes is exactly a dialectic correction to that utilized by the methodological behaviorists before and during his research. The lingering influence of those old ways is still

with us as cognitive psychology; and, we should join Fred Skinner in repudiating that kind of "science." We are attempting to further the achievements of science, not the vested interests of power groups within professional psychology.

I will not label Fred Skinner a "Marxist", for the issues involved go far beyond squabbles over titles. It would be more accurate to state that both Skinner and Marx are portions of this paradigmatic revolution within science, of which I have spoken. Skinner had an advantage over Marx, in that he worked a half century later, and probably had the benefit of reading Marx's writings. It is obvious to me that, while Skinner addresses many of the same problems Marx engaged, Skinner is providing us with a much clearer resolution of these problems. Marx's program for societal changes provide no specific kinds of remedies for difficulties involving the behavior of people, while Skinner does this. Many Marxists view Skinner as a reactionary thinker because, first, he comes from the most highly capitalistic society in existence (thus, he must be the enemy); and, second, Skinner does not seem to find much merit in violent revolution by the working class against the state and the propertied class. While Marx and Lenin insist upon this method of change in society, Skinner seems to direct us toward individual changes of life-style (15) or toward a gradual lessening of aversive governmental control over individual behavior and an increase of local control by positive consequences, which are mediated by members of the community. (16) Skinner does not see solutions to society's problems to follow as consequences of political activity; and, he does not believe revolution is likely:

"... a Communist revolution in America is hard to imagine. It would be a bloody affair, and there is always Lenin's question to be answered: How much suffering can one impose upon those now living for the sake of those who will follow? And can we be sure that those who follow will be any better off?" (17)

The later question poses Skinner no real problems, because the implementation of a science of human behavior could design contingency equivalence throughout a culture, especially if the community units were kept small and the term "nation" applied *only* to a certain geographical area. The real issue, for Skinner, is how do we know that the science of human behavior will, in fact, be used and not just simply forgotten about in the name of a totalitarian regime? And as things stand now, with most Marxists completely mis-understanding Skinner's work and the science of human behavior, it is very unlikely that such a science would be implemented. And so we are left to trust in the inherent "goodness" of human nature to assure us that any post-revolutionary leadership will act in everyone's best interests - which is a bet Skinner is not happy making. (18) The first question in the previous quote is really a vacuous one, in light of Skinner's own analysis of "values" in *Beyond Freedom and Dignity* - especially, the "value" by which cultures are judged:

"The simple fact is that a culture which for any reason induces its members to work for its survival, or for the survival of some of its practices, is more likely to survive. Survival is the only value according to which a culture is eventually to be judged, and any practice that furthers survival has survival value by definition." (19)

Skinner places the survival of a culture as a value above other values (such as "personal good" and the "good" of

others), because it is the value which selects these other values - insofar as they continue as "values" in a surviving culture. Survival of a culture is also called by Skinner the "good of the culture", which is, obviously, the "good of others who will follow". So, it seems that if sacrifice for the survival of the culture - for the good of those to follow - is needed, it should be made. So, I think Skinner's real objection to revolutionary change is that it is "hard to imagine", and that it would be a "bloody affair". Now, that is not to say that these are not valid objections - they are, especially for one who believes the needed changes can occur in other ways:

"The real mistake is to stop trying (to design a successful culture). Perhaps we cannot now design a successful culture as a whole, but we can design better practices in a piecemeal fashion. (20)

Such talk will certainly rankle most Marxists, and especially Marxist-Leninists. But, one needs to attend to the contingencies which generate both Skinner's position and that of modern Marxists. Modern Marxists have read Lenin railing at "revisionists", "reactionaries", and "enemies of the revolution", etc. But, Lenin was speaking to people who were actively opposing him in his efforts. Whatever they were doing to upset Lenin, would be reinforced by thwarting Lenin, which was obviously aversive to Lenin. But, Skinner's position on revolutionary change springs from very different variables than the positions of Lenin's antagonists. To mistake the two positions as identical, and then to label Skinner a "reactionary", would be to commit the "Formalistic Fallacy" (21) Skinner attributes to those who insist upon a structural analysis of behavior, as opposed to a functional analysis. No scientist should make that error. Obviously, Skinner's history is the psychological laboratory - not the political arena, and there is nothing in a laboratory resembling revolutionary change, except the chaos of an utter lack of design. Now, consider the following:

"Lastly, a culture will have a special measure of survival values if it encourages its members to examine its practices and to experiment with new ones.

A culture is very much like the experimental space used in the analysis of behavior. Both are sets of contingencies of reinforcement. A child is born into a culture as an organism is placed into an experimental space. Designing a culture is like designing an experiment; contingencies are arranged and effects noted. In an experiment we are interested in what happens, in designing a culture with whether it will work." (22)

One sees in Skinner the concern of a scientist for control, but one does not see reactionism. If a group of cultural designers had the complete control of a scientist over an experiment, and if these designers utilized the analysis of behavior Skinner has provided, then the design of the culture would proceed quite like Skinner describes above. The error in this analysis, however, is that in this century at this time all the control is in the hands of a very few reactionary capitalists, whose behavior is under the control of maximized profits; the control does not reside with well-wishing scientists or cultural designers, whose behavior is under the control of the "good of those to follow." Because of this analysis that "designing a culture is like designing an experiment," Skinner is led to suggesting change through design and experimentation in small communities, like Walden Two. In the novel of the same name, Skinner offers us a conversation between the community's designer, Frazier, and the incredulous visiting professor of philosophy, Castle. The

issue is the relationship of the isolated little community with "government" of the larger state or nation in which it rests:

"As we use the term these days, government means power - mainly the power to compel obedience," Frazier went on. "The techniques of government are what you would expect - they use force or the threat of force." (23)

"Governments must always be right - they can't experiment because they can't admit doubt or question." (24)

"How sincere are these liberals, anyway?" Frazier went on. "Why don't they build a world to their liking without trying to seize power? It simply isn't true that all governments persecute everyone who succeeds in being happy! On the contrary, any group of men of good will can work out a satisfactory life within the existing political structures of half a dozen modern governments." (25)

One cannot beg the question "what is the origin of governments or the state?" Governments do not exist as some kind of metaphysical requirement for mankind to live in social groupings; "governments" consist of laws and applications of these laws - i.e., providing consequences (usually aversive) for the behavior of individuals in the group. Thus far, the state seems neutral and this is as far as Skinner seems to go. What Marx has shown is that the centralized power to coerce called the "state" arises not out of a vacuum, but out of the antagonistic interactions between a minority who own land, wealth and structures (the means of production) and a majority who has none of these, and who must work for the minority in order to be able to live, at all. Thus, Marx's analysis of the state or government states that the occasion for its development, in the first place, is a class distinction between the rich and the poor. If the poor can live only by working for the rich, they will do so, but it will be an aversive situation, because the rich will expect to get the greatest amount of labor for the lowest possible wage. The working class may countercontrol by organizing and striking for higher wages, by picketing, or, possibly by seizing the means of production - it is *precisely* this form of worker countercontrol that is, in turn, countercontrolled by the rich through the formation of the state. The propertied class will simply hire workers at a slightly higher wage, arm them and call them "police" and "national defense." A few more workers are hired at more lofty wage-scales and are called "politicians" and "bureaucrats;" And there, loosely, according to Marx, you have government. It is obvious which of the class' best interests are served by governmental function. This, of course is a simplistic rendition of Marx's position; but, it is offered because I have heard it claimed that such talk does not apply to government in the United States, because of our traditions of human dignity, freedom and basic rights. Skinner treats that issue in *Beyond Freedom and Dignity*, which we will turn to at a later point, but that is a behavioral treatment - we need to continue here with an economic analysis.

Certainly, our form of government was established as a form of popular countercontrol of the class exploitation, but it contained a flaw, capitalism, which makes Marx's analysis of government as an instrument of class exploitation fit us today. The U.S. placed emphasis upon a system of free enterprise, which does nothing but place individuals in competition with one another for the available wealth or reinforcement available within an economic system. This will tend to shape up a large variety of aggressive behaviors called "good business practices." If there is one process that is the most general within a capitalistic system of economic

exchange, it is that reservoirs of capital tend to accumulate and grow by absorbing smaller reservoirs - this translates into bigger businesses grow by buying out smaller ones. The result is a tendency toward fewer "owners" and more "workers," since, for example, a small baker who cannot compete with a larger bakery will sell his business to the large bakery, but now he must work for the large bakery as a salaried employee. Inheritance tax laws were originally intended to off-set this tendency for capital to accumulate; however, with the process of "incorporation," the resulting "immortal persons," or "corporations" circumvented the inheritance laws. This accumulation of long-standing reservoirs of capital was further aided by the legalization of "trusts" and "foundations." Supposedly, the establishment of trusts and foundations cancelled "ownership" of large resources of capital, but this is a red herring, because it is not "ownership" of capital per se that is critical - it is the control over its use that is critical. And, trusteeships and foundations simply leave control of capital with the original owners. It is often pointed out that our welfare systems and such revisionistic programs as unemployment compensation are provided on the behalf of the working class by government. Again, this is a red herring, for it is *just* less expensive for the propertied class to provide such benefits than to provide full-employment. And, the threat of unemployment works to soften employed workers' demands for better wages. Now, Skinner is not insensitive to such issues, for he does state:

"... people differ in their ability to acquire property and hence in the quantities they possess, and since possession usually makes acquisition easier, differences have become very great." (26)

But, he does not allow this to cause him to be suspicious of government, beyond its typical uses of aversive control. But, one *must* ask who is really controlling whom and in whose best interests? At this point, Marx's notion of the state is relevant. In *Walden Two*, just following the three statements quoted earlier, Frazier is talking about the near self-sufficiency of his community, and Castle wonders how this sets with the rest of the society. Frazier's response is that it *was* somewhat of a public relations problem, but that problem is left to a "Manager of Public Relations," who will see to it that only the best propaganda is given to the wider society about Walden Two. The telling statement by Frazier is "All we ask is to be left alone." (27) Castle responds by asking if they will, in fact, *be* left alone? However, the discussion that follows misses an important number of points.

First, the interests of the major national and multinational corporations are only served when they maximize profit taking. This means that they support mass consumption, disposable products and the exploitation of natural resources. If social experiments like Walden Two proved to be too successful, that success would threaten these values (would threaten profits), and such experiments would be subjected to the full wrath of the capitalistic interests. Given such a situation, it is not a bad bet that governmental regulation would quickly be brought to bear at an intensity that would squash the Walden Two's and Three's. It would be the Paris Commune revisited. Skinner places too much trust in the government's "leaving them alone."

Second, Skinner - correctly so - stresses the replacement of control by aversive methods with control by positive reinforcement (a point that Marx was incapable of

recognizing, because of his time in history). But, it is not enough to just champion systems of control by positive reinforcement. Certain economic factors *must* be taken into account in such an analysis. In any economic system, be it national or global, there is a finite amount of "surplus value" of labor or of reinforcers. Governments and propertied class members have been shaped into the use of aversive control techniques because such methods are relatively inexpensive to maintain. To control by positive reinforcement is going to ultimately cut into the profit margin - social reinforcement, as a conditioned reinforcement, can only take a controller so far. Eventually, conditioned reinforcers will have to be backed up with primary reinforcers, which subtracts from profits. Therefore, control by positive reinforcement will quickly prove to be unconscionable to the propertied class and to the governments they control. It just costs too much from their value system's point of view, and movements to establish control by positive reinforcement as replacements for systems of aversive control will, again, be squashed.

Third, we have to look at science, itself. What is science? Well, it is basically the *behavior* of people attempting to discover how the world is put together, and how it behaves when we behave in it. The application of the "knowledge" derived from scientific inquiry is called "technology." So far, no trouble - science teaches and technology applies those teachings for the "general good." This is a fairy tale. Skinner, in the very beginning of *Beyond Freedom and Dignity* says the following:

"In trying to solve the terrifying problems that face us in the world today, we naturally turn to the things we do best. We play from strength, and our strength is science and technology . . . But things grow steadily worse and it is disheartening to find that technology itself is increasingly at fault."(28)

Skinner continues to place the blame for this situation on human behavior, which is a correct move. He then spends the remainder of the text applying the analysis of behavior, stressing reinforcement, to demonstrate how science can correct the problem by altering the behavior of people. However, he does not carry the matter to its core. Certainly people mis-use science and over-use technology to pollute and rape the environment, and people fail to use technologies that are available for the general good. But, who are these "people," and do we possess the reinforcers to alter their behavior of recklessly applying technology? One finishes the book with a sense of optimism about our ability to change matters. But, those at fault, upon a sober re-thinking of the situation, appear to be the bankers, corporate magnates and land owners - the propertied ones among us. They have through application of funds directed the developments of science and the uses of technology, and caused the abuses Skinner addresses. So, in what manner of speaking can we "reinforce" more appropriate or responsible behavior on their part - by our "good wishes?" No. We are powerless to influence them in any conventional way. We cannot withdraw from the larger society and create our own utopian communities, we haven't control of any reinforcers except our own cooperation, and we have no legal aversive control over these people that has been effective in the past. So, although Skinner would have it differently, there exists no remedy which is more delicate than that pointed out by Marx. Though Fred Skinner may regard revolution as having little survival value for our culture, it may just be that the only chance our culture has for survival ("for the

good of those to follow") is to be found with Marx.

It appears that we are in somewhat of a corner with respect to what is to be done. We have a science of human behavior and its attendant technology, which can virtually assure us of a just, harmonious and fulfilling society - but we cannot apply it to the extent needed, because we haven't the "permission" or the resources. We have, too, the justification for and the strategy of a seizure of the opportunity and resources to really re-make our society; but, how can we insure ourselves that we will not fall prey to an equally rotten situation under a totalitarian dictatorship? The only hope seems to be a marriage of Marx and Skinner. We must dispose of the tyrants, certainly; but, the change must be over-seen by individuals capable of applying the science of human behavior to insure a just result. Simply, Radical Behaviorists must become Marxists, and Marxists must become Radical Behaviorists - and together they must act.

In the area of politics, it seems that Marx takes an edge over Fred Skinner. In the arena of philosophy, both Marx and Skinner have exceptional grades - they are absolutely compatible. Both work to excise idealism/mentalism, mechanistic materialism and all of the modern developments of these philosophies - Logical Positivism, Pragmatism and Methodological Behaviorism. In the area of scientific methodology, Skinner stands far above Marx. Skinner has got nearly the last word on psychology and human behavior, which is absolutely necessary for a successful social design, in a post-revolutionary period.

Having given the edge to Marx in political action, it seems that I must return to Fred Skinner's work. It is extremely important that one should show, not just claim, Skinner's differences with Logical Positivism/Operationism, especially since we saw before how Boring tended to group Skinner with the Bridgmanian Operatonists at Harvard (10).

Skinner and Private Events

It is true that Skinner was trained at Harvard, and was influenced by Bridgman's position, and one could probably stretch the definition of "Operationism" to include Skinner, but the term would essentially mean nothing more than "Observationist." Sometimes it serves better to discriminate among various positions than to work at generalizing to similarities. Skinner defines the "operant," certainly, in operational terms, since it cannot be defined without regard to the contingencies which shape and maintain it - to define behavior only in terms of its topography is regarded as an incomplete structuralism, which can lead into the Formalistic Fallacy.

Now, with that much said, I will cut to the *real* issue here - the discrimination nearly everyone fails to make regarding where Fred Skinner belongs. Skinner does not allow his operational definition of the operant to panic him into subjective idealism - i.e., he is not driven to "operationally define" the concept "real world", and wind up with his sense data as primary. One either accepts the world and the data to be real as given - or one does not. The first move is that of Skinner, the second is that of the Logical Positivists. Skinner is not attempting to construct a proof that the world really exists, he is attempting to study the behavior of the people living there; and, as far as modern science is concerned, any other move is speculative nonsense.

To illustrate how this simple point is overlooked, I should like to quote Professor Brett quoting Skinner:

"A typical expression of the view (operationism) is that of Skinner: 'Operationism may be defined as the practice of talking about (1) one's observations, (2) the manipulation and calculational procedures involved in making them, (3) the logical and mathematical steps which intervene between earlier and later statements, and (4) nothing else'" (30)

The quote is essentially accurately taken from Skinner's 1945 paper "The operational analysis of psychological terms." However, the fourth aspect, "nothing else," is in italics, and Skinner continues:

"And, (4) *nothing else*. So far, the major contribution has come from the fourth provision and, like it, is negative. We have learned how to avoid troublesome references by showing that they are artifacts which may be variously traced to history, philosophy, linguistics, and so on. No very important positive advances have been made in connection with the first three provisions because operationism has no good definition of a definition, operational or otherwise. It has not developed a satisfactory formulation of the effective verbal behavior of the scientist." (31)

It hardly seems that Skinner is aligning himself with operationism in this passage. The "nothing else" could be translated "and without recourse to mentalistic explanatory fictions to handle the behavior of others or falling into a subjective idealistic confusion with respect to one's own discriminations and verbal behavior". The issue for Skinner is to forbid *any* form of mentalism - be it a form of slipping old mentalistic (or intervening pseudo-physiological) variables into one's talk about behavior, or be it a form of mentalism in which the scientist gags on his own private world and then claims to have access only to that world. It was clear in 1945 that Skinner was opposed to three distinct kinds of scientific blunders, which psychology had managed to commit since 1900.

First, he is against the positivistic tendency to labor under the philosophical tradition of idealism, making the tacit assumption that one's private or subjective realm is most directly, therefore, more primarily accessible to people than is the world they inhabit. Skinner will not stand for the move of regarding "sense data" as copies of the outside world, which we respond to, file away, retrieve and compare to new "sense data." The so-called "sense data" of the positivists are *nothing more or less* than our discriminative interaction with the physical world. I cannot stress enough the importance of this point-it may appear to be mundanely simple, but virtually all critics of Skinner overlook the revolutionary position on this matter. Skinner's position force us to drop the traditional distinction between "sensation" and "perception" psychologists have been so comfortable with for so long. Such terms are not helpful to an analysis of behavior - an organism does not first "sense" or "perceive" a stimulus and then respond to the sense or the perception. An organism simply responds to a state of affairs in the physical world which we have come to label a "stimulus." The use of "sense" or "perceive" in this fashion tells us nothing about the behavior of an organism - all it does is provide us with a sample of verbal behavior from a person whose reinforcement history has shaped him to utter those two words at certain times and places. Skinner denies any meaning whatsoever to the notion "subjective experience" as it is invoked by positivists, which we shall see in a moment.

Secondly, Skinner refuses to allow for the Watson-Hull brand of methodological behaviorism, in which

pseudo-physiological intervening variables are introduced to force all behavior to fit into the reflexive or mechanistic mode. In such systems, the "conceptual nervous system" generated is a thinly-veiled substitution for "mind". It matters little, for instance, whether you "explain" behavior with the fictional concept "conditioned inhibition" or that of "ego defense through repression". To avoid such a criticism, a methodological behaviorist may see his inventions as theoretical postulations of real, but as yet uncovered, physiological processes. Skinner objects to this move because, in a sense, physiologists, whose business it is to lay out the physiological story, take psychologists too seriously:

"Rather than attack mentalistic concepts by examining the behavior which is said to be explained by them, the physiologist is likely to retain the concepts and search for their physical bases . . . The unhappy result is that the physiologists usually look into the black box for the wrong things." (32)

But, beyond that, even if a physiologist could trace all the activity from the onset of a sound (an S^D) to the completion of a lever press (an R), and present us with a physiological wiring diagram of what was found, it would not adequately account for *that* response having followed *that* particular sound. A simple "is followed by" would replace all of the work of the physiologist in functionally accounting for the occurrence of the lever press. If any S "is followed by" any R, in a consistent fashion, by simply stating the fact, we have assumed a physiological connection. To assume that all behavioral phenomena can be accounted for by a mechanistic physiologizing is a reductionism that does not square with an operant analysis. And, where this is true for the rat, it is especially true for the behavior of human beings, most of whose behavior is shaped and maintained by social variables involved in interlocking contingencies. Said another way, with respect to operant behavior, most of the important variables cannot be taken into account by physiology.

Thirdly, Skinner denies mentalism in the form of a Cartesian or Freudian dualism, so a simple redefinition of such terminology in "behavioral operations", may be an interesting exercise, but it cannot take the place of a rigorous and direct functional analysis. Such an exercise may yield evidence that a functional analysis can replace a psychoanalysis, but a complete scientific research program is an on-going requirement.

In the face of Skinner's absolute rejection of all forms of mentalism and idealism, many then conclude that Skinner studies only an "empty" organism - that "private events" are beyond the scope of a functional analysis of behavior. And, since both methodological behaviorists and the Logical Positivists place mental events beyond the scope of a "scientific" analysis, many make the error of assuming Skinner's position is similar. Skinner speaks to this point:

"The distinction between public and private is by no means that between physical and mental. That is why methodological behaviorism (which adopts the first) is very different from radical behaviorism (which lops off the latter term in the second). The result is that while the radical behaviorist may in some cases consider private events . . . the methodological operationist has maneuvered himself into a position where he cannot. 'Science does not consider private data,' says Boring." (33)

One has got to realize that this was written well before Skinner's thorough and remarkable treatment of verbal behavior, in which the private realm is directly confronted. In 1953, Skinner's position has not been modified:

"When we say that behavior is a function of the environment, the term 'environment' presumably means any event in the universe capable of affecting the organism. But part of the universe is enclosed within the organism's own skin . . . With respect to each individual, in other words, a small part of the universe is *private*.

We need not suppose that events which take place within an organism's skin have special properties for that reason."(34)

Much of the text of *Verbal Behavior*, published in 1957, deals with the problem of how private events can come to control verbal behavior. But, let us look at Skinner's position in 1969:

"It is particularly important that a science of behavior face the problem of privacy . . . An adequate science of behavior must consider events taking place within the skin of the organism, not as physiological mediators of behavior, but as part of behavior itself. It can deal with these events without assuming that they have any special nature or must be known in any special way. The skin is not that important as a boundary. Public and private events have the same kinds of physical dimensions."(35)

In 1971, Skinner is maintaining the same point:

"The problem arises in part from the indisputable fact of privacy: a small part of the universe is enclosed within a human skin. It would be foolish to deny the existence of that private world, but it is also foolish to assert that because it is private it is of a different nature from the world outside. The difference is not in the stuff of which the private world is composed, but in its accessibility."(36)

I am not offering an exhaustive list of quotes on the matter from all these sources: however, my point is to demonstrate the consistency of Skinner's position from 1945 to the present. And, in 1974:

"A small part of the universe is contained within the skin of each of us. There is no reason why it should have any special physical status because it lies within this boundary, and eventually we should have a complete account of it from anatomy and physiology. No very good account is now available, however, and it therefore seems all the more important that we should be in touch with it in other ways. We feel it and in some sense observe it, and it would seem foolish to neglect this source of information just because no more than one person can make contact with one inner world. Nevertheless, our behavior in making that contact needs to be examined."(37)

This is quite a pithy statement. If read closely, it reveals Skinner committing radical behaviorism to the investigation of the role of private events in behavior, discriminating his position from that of Logical Positivism, operationism and methodological behaviorism, and suggesting a tactic by which the role of private events can be analyzed. I want to offer a final quote:

"Self-knowledge is of social origin. It is only when a person's private world becomes important to others that it is made important to him. It then enters into the control of the behavior called knowing. But self-knowledge has a special value to the individual himself. A person who has been 'made aware of himself' by the questions he has been asked is in a better position to predict and control his own behavior."(38)

What begins to emerge from these statements is what *should* be the familiar Skinnerian argument concerning how the verbal community shapes up self-tacting of private events in individuals in order to gain access to more precise predictions

of individual behavior and to instill a method of social control. This is accomplished by differential reinforcement and punishment of the accuracy of self-tacts, using public accompaniments of private events as the criteria. I will not elaborate on this process, except to state that radical behaviorism should be analyzing the process by which we come to speak of private events - i.e., we should analyze the reinforcing practices of the verbal community in shaping individuals to engage in self-tacting.

What I want to offer here is a quick blush of Wittgenstein's treatment of the possibility of a personal or private language about private events in *Philosophical Investigations*; and, I do so because it offers evidence for the plausibility of the Skinnerian position. But, the discussion is of even greater interest, because it represents a change of "mind" in a philosopher of some weight, who was, as we saw previously, at least somewhat connected with the origins of Logical Positivism - the Vienna Circle.

Suppose I wish to set out to establish my own private language, with respect to my private realm - i.e., without regard to the rest of my verbal community. I begin in the morning to attend to my private realm, hoping to observe a "distinctive" event. I "experience" such an event, and I select a name for it: it will be henceforth called by me a "gloph." So, I say to myself, "I am now engaged in having a 'gloph,'" and I may even write it down in a private diary - "this morning, at 8:03 A.M., I had my first gloph!" I wait, in anticipation, for another such event. At 10:12, I notice that I am having another private event. Now, is it a "gloph," or is it some other event, a second kind, which I want to call a "prist?" I need to write in my diary either "gloph" or "prist," but how do I decide what it, in fact, really is? In other words, by what criteria do I select a name or a tact for the event? I haven't any criteria. I may "choose" to write whatever, for whatever reasons/causes I may be "subject to." I write "gloph," but what does that mean, for I embody both the event, "gloph" or "prist" and whatever "criteria" I may "believe" I use to "decide" upon the selection. Under the "rules of the game in such a language," I can never be wrong in my tacting - and if I can never be wrong, it makes no sense to claim I am ever right, for there *is* only what I claim. Well, this is nothing but a flaming form of solipsism, and a "private language" about private events is a meaningless exercise, except to fortify the necessity to include the function of the verbal community in the development and practice of any language.

If one approaches the use of language as Skinner has done and treated it as *just* very complex operant behavior, the consequences of which are mediated through the behavior of other people, any retreat into positivism, idealism or mentalism seems utterly ludicrous. As Skinner states:

"In the fifty years since a behavioristic philosophy was first stated, facts and principles bearing on the basic issues have steadily accumulated. For one thing, a scientific analysis of behavior has yielded a sort of empirical epistemology. The subject matter of a science of behavior includes the behavior of scientists and other knowers. The techniques available to such a science give an empirical theory of knowledge certain advantages over theories derived from philosophy and logic. The problem of privacy may be approached in a fresh direction by starting with behavior rather than with immediate experience. The strategy is certainly no more arbitrary or circular than the earlier practice, and it has a surprising result. Instead of concluding, that man can know only his subjective experiences - that he is bound forever to his private world

and that the external world is only a construct - a behavioral theory of knowledge suggests that it is the private world which, if not entirely unknowable, is at least not likely to be known well. The relations between organism and environment involved in knowing are of such a sort that the privacy of the world within the skin imposes more serious limitations on personal knowledge than on the accessibility of that world to the scientist." (39)

This is a remarkable passage, and should be savored slowly. It renders to shambles 3000 years of idealistic philosophy with one sweep of the epistemology of modern empirical science. When science is finally brought to bear upon the verbal behavior of scientists and philosophers, a great deal of chaff is blown away. And, if the picture presented (of the behavioral process of coming to tact private events) is combined with the Skinnerian notions of "seeing" objects in the absence of the objects "seen" (sensing stimuli in the absence of the stimuli sensed), of the autoclitic function of verbal behavior, and of the speaker and listener in a verbal exchange behaving within the same skin, one begins to construct a complex and rich description of the behaving human being which pales the idealistic notion of the "mind" and leaves it unintelligible. And, if one feels plagued by the nagging concept of "consciousness," relief is obtained by attending to Skinner's analysis of "seeing". Simply put, the word has been traditionally used to tact three distinctly different operants - "looking", "seeing", and "seeing-that-you-are-seeing". The first could be described as behaving appropriately to contingencies, and doing *nothing* else, such as interrupting on-going operant chains with new behaviors, or engaging in verbal behavior. Mentalistically, one could describe such behavior as "unconsciously" engaging in ordinary "habitual" behavior. The most striking example of this kind of behavior is driving an auto down a freeway and suddenly realizing that for twenty minutes, you have not "paid the slightest bit of attention" to driving. The discrimination is usually accompanied by a mild startle reaction. "Seeing" can be described as behaving appropriately to a sudden stimulus change, which can include stimuli presented by the verbal behavior of one's own or another person, which occasions a new operant chain. For example, during a period of time when you are "looking" your way down a freeway, the sudden on-set of brake lights on a car ahead will occasion you to "see" the change, and behave accordingly by slowing. Also, a passenger may disrupt the "looking" by manding "what state is that car from?" You may answer "Florida," but not get "consciously" involved in the interaction. Likewise, a circling owl may be "looking" at the meadow below, but will "see" the movement of a scurrying mouse, and swoop down for the reinforcing consequences. The third kind of behavior, "seeing-that-you-are-seeing/driving/walking" etc., involves a verbal self-tacting of one's own body or on-going behavior in response to a mand from another person (or, even from one's self). Such mands may include "Don't you think you are driving a bit fast?" followed by a self-tacting verbal response. When one realizes he has not been attending to his driving for twenty minutes, a self-mand ("Hey, what am I doing?" or "Oh, my God, I . . .") may occasion a self-tact, like "I haven't been paying attention to what I am doing since leaving Slippery Rock!" This is the sort of behavior usually referred to as "self-consciousness," and it is mediated *completely* through verbal contingencies.

This short discussion was certainly not meant to offer a

radical behavioristic analysis of the "mind" however, it illustrates at least that we have some unique points to make and some radically different directions to take in a scientific analysis of the kind of human behavior that has, by its sheer difficulty, been left to the idealistic philosophers for action. By providing a method of analyzing such profoundly difficult issues, Skinner is successfully blazing trails into the bastions of idealistic "explanations" of behavior. Any further excursions into this area are not relevant to this effort, because we still have to cover the most important reason why Skinner's science of human behavior is vital to any popular or Marxist political movement. Marx's writings contain little useful psychology of individual behavior. Once a transformation of society is achieved (once power is shifted), Marx is not too helpful in engineering a truly productive and harmonious social design. You need only to look at current Soviet psychology to quickly see their entrenchment in Pavlovian conceptions of behavior. Skinner, alone, can handle the design of a post-transition economic-distribution and social-control design of society. And, to that issue we must finally turn.

The Importance of Skinner to a Post-Transition Society

If one is capable of cutting through to the so-called "bone" or in this post Nixonomic period the "bottom line" you will see that a science of sociology involves the identification of the methods of control and countercontrol that exist in a society among individuals, among individuals and groups, and among groups. History demonstrates that most control-countercontrol exchanges center upon "power struggles" involving the capacity of each party to hurt or injure the other, thus forcing compliance to the satisfaction of the stronger party, while the weaker whimpers, accedes, suffers and "hates" - awaiting "another day". Skinner's work has gotten to the reality of how people control and are controlled, and he has teased out two basic methods: control by reinforcement, and control by punishment. No social design can work, unless this distinction is taken quite seriously in the designing.

Some of the reasons why control by punishment is the prevalent form of social control are that it takes less time and effort on behalf of the controller and it seems to be less costly, in the short run, than control by positive reinforcement. It could be theorized that human beings are "genetically programmed" to aggress, but it is more probable that the reason control by punishment occurs so frequently is that the use of punishment is usually immediately negatively reinforced. If someone is engaging in bothersome behavior, a slap may stop the behavior, and the probability of future slapping increases. Of course, what is not taken into account is that aversive stimulation always shapes up escape and avoidance behaviors, which can be of many topographies - passiveness, isolation, neurotic or psychotic symptoms, drug addiction and even direct counter aggression. If the social order is a class society, those controlled by aversive techniques (the working class), may coordinate counter-control by direct aggression against the controllers, and a revolution occurs.

Any social situation involving aversive control is a highly unstable state of affairs; and, any society employing aversive control is a class society, because aversive control among equals results in less negatively reinforcing compliance and more direct countercontrol. In *Beyond Freedom and Dignity*, Skinner has discussed how this society disguises its actual nature with the literatures of freedom and dignity. He

demonstrates how these concepts of human freedom and dignity simply function to "morally" or "ethically" justify the use of aversive control and punishment. Though these concepts may be loaded with philosophical and theological "substance," they have no scientific validity. In this society, they function only to support a specific ideology, specifically that while all of us are dignified, some - to their credit - are more dignified and entitled to more wealth. Those who "freely choose" to behave or live in an undignified fashion, since they are *free*, are fully responsible for that state of affairs; and, if it bothers others or infringes upon their freedom or dignity (wealth), the full retributive power of the state will be brought to bear upon the offenders. If laws are clearly broken, the offender is labeled "criminal" and dealt with by the prisons; if, however, laws are not clearly broken, but the behavior is still bothersome, he is labeled "mentally ill" - or not fully responsible - and is dealt with by the medical profession. So, as the story goes, we are all born equally free and dignified - the Du Ponts and Mellons, the Cleavers and the Mansons - and we are responsible for what we make of ourselves.

The social control practices in effect today are very thinly veiled extensions of the doctrine of social Darwinism espoused by John D. Rockefeller and Andrew Carnegie at the turn of this century, despite the social reform propaganda to the contrary, such as the current talk about "human rights". It is inescapable that Skinner's work has demonstrated that aversive control will produce disastrous behavioral repercussions. Skinner has shown that the only workable form of control is through positive reinforcement. People do not countercontrol when their behavior is shaped and maintained by positive reinforcement - and, in the process they will "feel" quite free from "control" and will likely state that they are happy. Control by positive reinforcement, however, does *not* mean simply giving a minimum standard of existence noncontingently via welfare checks or unemployment payments or the lowest possible salaries, and then threatening to take even that away if people express their lack of satisfaction. This is control through the lessening of threat - or control by negative reinforcement.

There is no behavioral way around the issue as Skinner has presented it. To have a just society, you have to design it so that people actually receive the "good life" contingent upon being contributing members of the society. Obviously, this form of design is going to cost a great deal of money and goods - certainly far more than present methods of social control through coercion. As a matter of fact, it is probably a prohibitively expensive form of cultural design for any society that allows vast private accumulations of reinforcers in the form of capital holdings. It may seem naive to claim that the real cause of crime is capitalism, but it is rather more naive to assume that capitalism is not the cause, in large measure. If ten people are stranded on an island, one possessing a large amount of food - the only food on the island - while the others have nothing, it would be no surprise to observe attempts by the have-nots to take food from the one having it, who will call such attempts criminal acts. The person with the food supply will have to quickly come to an agreement with two or three of the others to work to protect him from the others for some portion of the food, and they will call this agreement the "state." Eventually, one or two of those functioning as the "state" may realize that their job of protecting the one with the food might be made easier if they could persuade him to toss out a few bits

of food occasionally, because they could then say to the others "see, what we are doing in *your* behalf, you should not beleaguer us". And they will call the bits of food "welfare handouts" and the fact that the others do not attack them "re-election" "a vote of confidence", or even a "mandate from the people". The people they will call "lazy", or "greedy" and "free and responsible". They will call themselves "dignified;" and, they may eventually draw up a list of certain things they will *let* others do, calling it a "bill of rights".

Suppose, however, the person with the food did not just "possess" a certain amount, but happened to "own" the only acre of land on the island capable of growing food, but it was very fertile and produced far more than he - or even all ten - could ever use. If he then proceeded to build private silos for food storage, and finally followed the scenario above, his behavior would be considered even more unjustified. Yet, this is precisely the state of affairs we have, except that we are offered wages to take part in productive labor - those who find work, that is.

Marx claimed that salaried workers are "alienated" from their work and the products of their labor, and this is undoubtedly one of the reasons why many modern workers find their working conditions so dismal. It is often said that another reason is that many modern jobs involve small repetitive tasks within a huge mass-production line, so the jobs are simply "boring" and "meaningless." This adds very little to Marx's alienation. Skinner, however, does add to Marx's position. Many modern jobs take little training, and even for those that require some degree of experience, large pools of experienced unemployed or underemployed workers are waiting to step into these jobs the instant they are vacant. Thus, the modern worker's job is insecure. He trudges into the office each day and goes through the motions of the work. But, this is not because of the paycheck he receives once or twice each month; it is because he is constantly under the threat of losing his livelihood. In other words, his labor is not positively reinforced, it is an avoidance behavior (which always involves unpleasant emotional correlates) negatively reinforced each day by a reduction of the threat of unemployment. But, even a flawless performance at work will not insure his employment, for he is a guest of the owner's profit margin. A slippage in sales or an increase in the cost of materials or equipment, sudden technological breakthroughs in automation, cut-backs in public funding and corporate mergers, among other events, all maintain the threat of sudden unemployment. What is good for business seldom encompasses the best interests of the workers. The situation for the American worker is not far removed from that of the "have-nots" on the island.

Skinner's program for a productive, harmonious society would require specific changes in the distribution practices on the island. First, distribution of food has to be wrenched from the control of the person who happened to find himself "in possession" of the fertile ground, and his hired hands would have to be put to other endeavors than insuring the distributive balance remained firmly in his favor. This is the point at which Skinner proposes that small communities should become self-sufficient; and, as we saw previously, this would not be tolerated - no land baron will be gently induced to lay down his profit ledger and join his fellows weeding in the garden. This seems again to drag us into the question of revolution and its apparent inevitability, but we shall again duck that issue.

It still stands that Skinner would require some changes in the practices of the islands's fertile-land owner. He must yield his "ownership" to the community, in general. All ten inhabitants should meet and decide, in a democratic manner, what kinds of behaviors would tend to increase the quality of life for all community members. The function of the "state" would be to distribute food to all community members contingent upon the kinds of behaviors all had decided were valuable to the community's quality of life. Appropriate distribution of food by the "state" would be one of these valued behaviors, and they would receive and be retained contingently upon their performance - i.e., the "state" would work for the community as a whole, and those in such jobs would be subject to immediate recall if they could not serve all. They would then be allowed to select another function, in which they *could* serve all. Everyone would receive a basic and comfortable income, with small differences being allotted with respect to amount of time spent engaged in work productive to all and with respect to the level of unpleasantness of that work. The unpleasantness of the work would be determined by the volunteer rate of all community members to engage in such functions. Hence, on the island, a trash collector who grew tired of his work could accept a lesser rate of pay to train in the behavioral sciences and then assume a chair to teach. The instructor, who required more pay, could collect trash at a higher rate of pay as long as he was inclined. The obviously lavish latitude of labor pursuits allowed on the island would be at the expense of a departed propertied class, accumulating wealth beyond its ability to consume. Bank accounts would be replaced by a return of excess to the communal fund; and, personal emergencies would be met by that communal fund. The fossilized waste of personal profit taking and reinforcement accumulation, beyond consumption levels, would be eliminated. Insurance programs against the short-comings of communal design would be replaced by design insuring community support of all. And, the need for coercive enforcement of roles designed to enhance the life-styles of a few would be replaced by distributive practices designed to insure the well-being of all, and to enhance the chances of the survival of the entire community on that little island.

This all sounds a great deal like utopian thinking. But, this is not because it was meant to sound that way; it is because all utopian thinking had the goal of producing the kind of social organization Skinner offers, but had no concept of *how* to design that organization. Marx had a glimmer of the road - propertied classes and private accumulations of reinforcers to the extent of danger to the community's well-being have to go. But, after the transition to the new order, Marxist regimes have often fallen back into a predictable use of aversive control; and, hope for a new social order shrivels into despair and further counter-control by the people. Skinner alone can offer us a science of human behavior that will work. And, Skinner alone, can after rejecting the value of human dignity because only the very few really have it, re-issue that very value of human dignity to all members of the new social order, in which all, not just the few, are treated with dignity. In Skinner's social order, "freedom" is disarded in the tired philosophical wrappings of "free will", but it is reaffirmed as new value of freedom *from* aversive control. What Marx has overlooked in cultural design, Skinner furnishes us precisely; and, faithfully maintained (and he does address *that* issue), it would certainly be the classless society Marx envisioned - and one not threatened from within by

revolutionary movements.

But, beyond his suggestions for the ultimate social design, there are more central reasons why Skinner's science of behavior is precisely the dialectical materialist psychology that breathes life into the Marxist position. Recall the emphasis placed upon the "paradigmatic" shift or revolution in scientific thought. The shift was one from mechanistic materialism to dialectical materialism, and no where is the function of the dialectic clearer than in the new behavioral paradigm of Skinner. Remember that until Skinner, American psychology had been busily attempting to cram all behavior into the mechanistic S-R paradigm, because, as it just happened, the first really scientific work on behavior had been conducted by Pavlov on the action of reflexive conditioning - where the S-R paradigm is quite perfectly applied. However, Watson and the methodological behaviorists and later cognitive psychologists who followed have all completely missed the boat, reviving a kind of mentalism to handle the inadequacies of the S-R paradigm. Skinner agreed with Pavlov on reflexes and how they can be "conditioned" to novel stimuli, seeing them as innate or inherited "pre-writings" in the organism's neurology. And Skinner, following Darwin identified the provenance of reflexive behaviors as the evolutionary history of the survival of the particular species. But, Skinner made that one critical step, which has gotten him labeled a "two-process theorist". He reached back to E.L. Thorndike's "Law of Effect" and then even further back to Brentano's principle of "intentionality", and he offered us the discrimination of operant behavior. Thorndike's principle is quite like the principle of reinforcement, since he claimed that the consequences (good or bad) of actions either "stamped in" or "stamped out" *that* S-R connection. Later, Guthrie will remove the "good and bad" criteria, and substitute a simple contiguity principle for the strengthening of S-R connections. It was Brentano's "intentionality" that gave a new sense to the "law of Effect", however. Recall that Brentano was attempting to distinguish between "mental acts" and mechanical actions. The latter seemed to fall under Newton's mechanics - they just occurred for obvious reasons in a one-way temporal direction. "Mental acts" seemed special because they didn't occur for such reasons. There seemed to be a "meaning" or a "rationality" to them. Call this a "plan" or a "purpose," but the point is that mental acts were incomplete in-and-of-themselves. Brentano felt that such acts "intended" or "pointed toward" some object, which functioned as a goal for their completion. The Aristotelian similarities are obvious, and Brentano was a card-carrying mentalist - "mental" acts were mental. Their "intended" objects could be other mental acts: I can "think about" or "intend" another thought - or, like the positivists, I can intend my own sense data. But, Skinner, the hard-headed materialist that he is, did not allow the "demon" intentionality or "purpose" to lure him into the skin of the organism. His move was to locate the "purpose" in the environment, where it has always been. "Purpose," as we use the word, is primarily a characteristic of the contingencies of reinforcement in the environment. If behavior is called "purposive" it is because the behavior reflects that characteristic through environmental shaping. Certainly, operant behavior is "purposive," insofar as it operates upon the environment to achieve certain consequences is what gives it survival value. But it is the environment by providing these consequences, which selects the behavior. So, the provenance of

operant behavior is the exposure of the individual to the contingencies of reinforcement and punishment comprising any individual's past and present world. Reflexive behavior springs from the environmental action of selection over the vast evolutionary history of the survival of the species; whereas operant behavior arises from the ontogenetic history of the individuals successive adaptation to its environment. Both origins are the environment, and the *causal* mechanism in each case is environmental selection.

Environments change quickly in small measure and very slowly in large measure. Operant innovations facilitate adaptation of the individual to short-term, minor changes. Reflexive innovations, passed on through genetic structural integrity, facilitate a continuing adaptation over vast periods of environmental stability of a general nature. Reflexive behavior does not seem to be "purposive," because the conditions of its selection are not usually clear. Operant behavior, on the other hand, does appear to be "purposive," because the environmental conditions for its selection are often clear, which leads one to see some "rationality" in the acts. And, we are so close to our own operant behavior, and have been shaped to "explain" it to the verbal community, that we easily generalize such "explanations" to the behavior of non-verbal creatures. However, our own verbal self-tacting can be shown to arise out of the selective action of the verbal community, and, so it is inescapable that the "purposiveness" of operant behavior lies, not within, but beyond the skin - in the environmental structure and processes, which mediate the selecting consequences of behavior. (Allow, me to inject a note. A good case can be made for the point of view that the real locus of the "purposiveness" of both operant and reflexive behavior is neither the organism nor the environment, but the relationship or "exchanges" occurring between both. In such a view, the environment is seen to behave with respect to the organism and vice versa. The structural organizations of both the organism and the environment set the boundary conditions for all possible change or interaction. This is probably the best position, and it clearly provides a better reconciliation of motion and form than Plato was able to offer in his Doctrine of the Forms.)

That behavior is "purposive" should not shock the scientist, who has worked his way out of the strictures of mechanistic materialism, and who realizes that Skinner borrows only the functional temporal configurations of Brentano's "intentional mental acts" and not the mentalism "as Marx borrowed the logical moves of Plato and Hegel, but not their idealism." But let me offer Skinner on "purpose:"

"Possibly no charge is more often leveled against behaviorism or a science of behavior than that it cannot deal with purpose or intention. A stimulus-response formula has no answer, but operant behavior is the very field of purpose and intention. By its nature it is directed toward the future; a person acts *in order that* something will happen, and the order is temporal. 'Purpose' was once commonly used as a verb, as we now use 'propose.' 'I propose to go' is similar to 'I intend to go.' If instead we speak of our purpose or intention in going, it is easy to suppose that the nouns refer to things." (40)

Of course, Skinner is here debunking that queer, but common tendency we have of observing an activity, abstracting a characteristic of the activity in the form of an adverbial modifier, then changing the adverb to a noun

form, and finally invoking the noun as the name of a thing, an event or a state that is out-of-sight or, at least, inside of the behaving organism, as a "cause" for the originally observed activity. For example, we observe a person engaging in a repetitive behavior that results in no immediately observable reinforcing consequences. The "reason" for this state of affairs is certainly to be found in one of several areas (highly stretched reinforcement scheduling, a long period of deprivation of the primary reinforcer, immediately unnoticed conditioned reinforcers, a history of avoidance conditioning with the removal of the primary aversive stimuli, etc.), but we may call the persistent behavior "stubborn" behavior. "Stubborn" is a trait of the behavior, but we abstract it in noun form - "stubbornness" - and then assert that entity as the cause of the behavior. "He acts thus *because* of his 'stubbornness.'" Or, we can take the trait of the behavior and assign it to the whole person, achieving the same result: "He behaves thus *because* he is a 'stubborn' person." What causes our difficulty here, is the same state of affairs that leads methodological behaviorism from a simple S-R position in Watson to the tedious "S-many intervening variables-R" position of Hull and the cognitive psychologists. It is a veiled attempt to save mechanistic materialism from the edges of "Newton's world". *Only a dialectical materialism can suffice for such complex phenomena, and only B.F. Skinner has outlined the course for psychological analysis along this line of thinking.* That is why Skinner and Marx play on the same team; and, labels and squabbles aside, we must recognize that we can save our illusions, or we can save our world - but, we cannot do both.

Conclusion

My thesis has been that Skinner and Marx belong together with Darwin and Einstein within a recent paradigmatic revolution in scientific thought. This is a revolution which distinguishes itself from all previous forms of mechanistic materialism, Logical Positivism, idealism, dualism and mentalism; and, I have chosen to adopt Marx's term for the new stance in science - dialectical materialism. But, beyond an eschewal of mechanistic and idealistic explanations, these thinkers embody important similarities. First, they are thorough-going materialists, with a new paradigm of "causation" - that of a selection within a smaller system's activity by an encompassing system's adaptation to the action of the smaller system. This selection process occurs through "consequences" the larger provides the action of the smaller. This mode of causation by selection is clearly seen in Darwin and Skinner; it is less clear in the work of Marx and Einstein. Einstein emphasized the relativity of the observed characteristics of material processes occurring at any point in space-time, which hints at, but does not declare, selection as a causal process. Marx speaks about the "dialectic" development of material phenomena, which declares, but does not give clear examples of the causal function of selection by the environment. Darwin declares that a mechanistic interpretation of biological evolution is inadequate, but the behavioral "atoms" of evolution - genetically inherited structures that predispose organisms to behave in specific modes - can be interpreted in a mechanistic manner. Only Fred Skinner can cut directly to the vital scientific issues, because only Skinner has brought this new trend of thought to bear upon the very behavior of the beings who produce science. Finally, with Skinner, we obtain a "fine-grained" statement of the meaning of the revolution

in science. With Skinner we not only interpret the material phenomena around us in the terms of the new dialectical materialism, we now begin to interpret our own interpretations of these phenomena. When the scientist who espouses a form of revolutionary thinking can understand his own thinking in those very ways, the revolution in thought becomes firmly established. With Fred Skinner, the circle now closes. Skinner has much more to tell us about human behavior than does Marx - his observations are more empirical and clear. Marx tells us that revolution is necessary; and, Skinner tells us how it must be designed so that it will work. Marx speaks of the revolution to a classless society, and he assumes that such a move is unavoidable. Skinner tells us why we are moved toward that revolution, as we seem to be genetically programmed to behave to countercontrol aversiveness in our physical and social environments. Since class control over class always assumes aversive channels, Skinner says this about Karl Marx's views:

"The necessary order in the historical determinism of Karl Marx is in the contingencies. Class struggle is a crude way of representing the ways in which men control each other. The rise of the power of merchants and the decline of feudalism and the later appearance of an industrial age (possibly to be followed by socialism or a welfare state) depend largely upon changes in economic contingencies of reinforcement." (40)

Skinner remains consistent in bridleing against thoughts of any form of violent revolution - but men are forced to countercontrol aversiveness in their environment. He suggests a possible socialism to follow the event of major countercontrol, yet he weakly offers a possibility of a "welfare state" as a meaningful resolution of the problem of aversiveness. But those receiving "welfare 'benefits'" today, or those standing in unemployment lines for their "benefits" do not provide any data supporting the welfare state as a solution. The fact is that any "welfare state" is inherently composed of class distinctions - those who have wealth graciously provide for the "welfare" of those who have little. The propertied class has, certainly, never volunteered such aid in the past, without being compelled to extend help. And, there is no scientific reason to expect them to behave with any larger measure of altruism in the future *without being forced*. However, the creation of a fascistic autocracy with the power to compel the wealthy to fund a "welfare state" is certainly not an option.

But the fact still remains, once the transition in social design is begun, little will be accomplished of any lasting value unless the behavioral principles of Skinner's science of human behavior are taken seriously into account. Marx always had great faith in science, but the area of scientific development which (1) adds much evidence to Marx's own theories of social evolution, and which (2) would have insured the establishment of scientifically designed social order (one without aversive control, where total distribution of positive reinforcement is made contingent upon socially constructive behavior), was not developed until the work of B.F. Skinner.

Footnotes

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