B.F. Skinner's Radical Behaviorism: 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 heroes 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 Parmedian 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 apprehend through our senses the material world of Heraclitian change in time and space. The other realm is that of the "idea" 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 craftsmen, 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.
(1) All Skinners are Behaviorists.
(2) All X is Y.
(3) All X is Behaviorists.
(4) All 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 it 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 worldly 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 preconceptions, 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 "autocritic" 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 illustrative 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 word 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 billiard 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 (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 abrogation, 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 "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 associationistic (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 materialistic/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, (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 unfree reflection 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 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 rubric 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

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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 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.
Watson'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 methodo-
logical 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:

$$S_{FR} = \{ (S_{HR} \times \Delta x) \xi v \} - (T_{R} + S_{FR}) - S_{IR}$$

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 Newtonian 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 - 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 troublesome 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 how 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 Menninger) 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 flush 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