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# RELIGIOUS BELIEF AND SCIENTIFIC WELTANSCHAUUNGEN

The dogma persists that the Hebraic-Christian religion conflicts with science and that science alone comprises a rational basis for understanding reality. What is so disarming about recent forms of this dogma, is that a scientific worldview or Weltanschauung is concealed with ostensive tolerance for the truth or meaningfulness of religious discourse. My goal is to expose and refute such dogma in several ways.

First, I shall review the empirical and theoretical structure of scientific theory in order to show that it is inherently incapable of being dogmatically juxtaposed to the Hebraic-Christian religion. Second, I will argue that several representative Weltanschauungen, which hold that all experience is understood through the empirical and theoretical framework of science are untenable if not incoherent. My aim is not to establish claims of the Hebraic-Christian religion or even to clarify the epistemic status of such claims. Rather, I seek to obviate the dogma that science renders traditional religious belief meaningless.

Let me specify what is meant by "Weltanschauung" and discuss scientific Weltanschauungen after briefly examining the nature and limits of scientific theory and its employment. This examination is not intended as an addition to the vast literature on the philosophy of science. Rather it summarizes epistemological difficulties which proponents of scientific Weltanschauungen, in their criticism of religious belief, disregard and exacerbate.

## I. Scientific Theories

My discussion of scientific theories shall initially concentrate on theories of physics which have methods of coordinating observation statements with theoretical ones, or concepts sufficiently clear for fruitful logical axiomatization. Such theories coordinate observation statements with theoretical ones that describe a logico-mathematical system at one time which,

when taken with substantive axioms and rules of logical deducibility, yield predictions of the system at another time. My reason for focusing on such theories is that they are generally conceded to constitute paradigm knowledge-yielding devices or explanations by which truths are obtained about reality.[1] Thus my analysis neglects many scientific theories that do not permit fruitful axiomatization, such as Darwin's Theory of Evolution, Hebb's theory of the nervous system, or theories about higher processes in psychology. How, in contrast to these, are the theories of physics employed? What are difficulties indigenous to them?

Simply stated, the employment of a theory of physics involves an initial observation statement, say $o_1$. It is typically comprised of such observation terms as "red" or "weight" which have immediate reference to sensory experience, and might be a statement of the sort "the pointer is at five." $o_1$ is "identified" with or "defined" in terms of a theoretical statement, say $t_1$, comprised of such theoretical terms as "wave function" or "mass," and is typically a statement of the sort "photons have zero rest mass." The correlation of $o_1$ with $t_1$ may be expressed by the symbol "$\approx$" to express that the relation is not one of strict equivalence of any sort. For the observation terms comprising observation statements are not readily admitted into logico-mathematical frameworks of theories. Rather, their translation into theoretical statements involves reducing inexactness for measuring and applying mathematics as well as disregarding observational properties which may be irrelevant to a given theory. Thus the reduction of an inexact observation statement, $o_1$, to an exact or more exact theoretical one with relevant properties, $t_1$, in terms of coordinating rules and definitions, may be expressed "$o_1 \approx t_1$." When $t_1$ is taken with a theory, say $T_0$, and rules of logical deducibility, say $\vdash$, a theoretical statement (prediction), say $t_2$, is logically derived. That is, $t_1 \wedge T_0 \vdash t_2$, where $t_2$ is itself coordinated with and understood in terms of an observation statement, $t_2 \approx o_2$, by virtue of which $T_0$ may be observationally corroborated.[2] (For my present purpose I avoid the controversy concerning whether the observation-theoretical distinction holds *prima facie* for many terms, e.g. "electric charge," or the degree to which observation terms and statements may

1. *The Structure of Scientific Theories*, ed. F. Suppe (Chicago: University of Chicago Press, 1979), pp. 64, 65, 716. This was an outgrowth of an international symposium held at the University of Illinois at Chicago Circle.

2. See Stephan Korner's *Fundamental Questions in Philosophy* (Allen Lane, The Penguin Press, 1969), p. 83, and *Metaphysics: Its Structure and Function* (Cambridge: Cambridge University Press, 1986). The ideas of this scheme are indebted to Korner.

be theory-laden). $T_0$ is comprised of general substantive axioms, such as $f=ma$, the content or application of which may be deduced or symbolically interpreted[3] in terms of $mg = md^2/sdt^2$ for free fall, $mgSin0 = -md^2/sdt^2$ for the simple pendulum, or $m_1d^2s_1/dt^2+k_1s_1=k_2(d+s_2-s_1)$ for the first equation of coupled harmonic oscillators.

There are several points, however, that beg clarification. First, classical mechanics might be used, for example, to calculate the free fall of a human being in terms of the symbolic interpretation $mg=md^2/sdt^2$. The *will* of the person to fall or not to fall may be appropriately disregarded but not denied by the scientist. In classical mechanics the electric charge of a particle as well as the free will of persons are both ignored. This reflects the limited ontology of the theory and not what does or does not exist in reality. This includes the possible existence of referents of religious ontologies, including God, soul, heaven, and hell. The objection that such notions refer to nonempirical entities merely begs the question regarding whether only observation terms and statements that are incorporative into scientific theories have ontological significance. But this can only be argued, as I will show, on pain of paradoxically insisting on the truth of a verification principle that itself has no truth-value.

Second, the observation statement $o_1$ involves interpretation in terms of specific theories, say $T_1, T_2, T_3 \ldots T_n$. Thus while $T_0$ represents a generic theory, different theories, say $T_1$ and $T_2$, may interpret the same observation statement differently. If, for example, "$o_1$" describes an illuminated patch in a cathode ray tube, $T_1$ may interpret "$o_1$" in terms of the Bohr theory of electron and $T_2$ in terms of another. $T_3$ may admit of no interpretation in the sense of permitting the schema "$o_1 \approx t_1$" to occur. Hence theoretical systems not only determine what phenomena are ignored or admitted but interpret them as well. Indeed, there are no so-called observational truth-claims which are independent of theoretical and possibly conflicting theoretical interpretation. This has obvious and immediate implications for those who glibly speak of brute scientific "facts" in conflict with religious belief. Even if scientists could agree on what the facts are, it would be rational to suppose that, given the supersession of theories in the history of science, any present theory by virtue of which these facts are assessed would be superseded by future theories.

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3. Suppe, pp. 465, 504.

Third, in tangency to point two, any two theories, say $T_3$ and $T_4$, may be contradictory or inconsistent but equally successful in explicating and manipulating phenomena. Following John Worrall,[4] there may be a translation procedure by which an account of phenomena in terms of $T_3$ may be turned into an account of that phenomena in terms of $T_4$. Such translatability would guarantee empirical equivalence of $T_3$ and $T_4$, not just with respect to known results, but with all possible results. Whether or not this condition in fact obtains is moot. The point remains that such a condition is always logically possible and has been called the "underdetermination of theory by data" thesis. If truth-claims, whether observational or theoretical, are true only by virtue of interpreting phenomena in terms of $T_3$ and $T_4$ which are inconsistent, then the world as understood through $T_3$ and $T_4$ is not the same world but rather different worlds. How are the possibly different and inconsistent worlds understood by science to be dogmatically contrasted to the world understood by the Hebraic-Christian religion?

Fourth, these criticisms are exacerbated by the fact that no amount of successful predictions (in terms of $o_2$) verify the truth of $T_0$. The possibilities of future predictions that may not obtain (not-$o_2$) are in principle limitless. This is precisely why philosophers of science do, or should, strictly speak of theories as being relatively corroborated, say as $T_5$ tending to have more empirical success and subsequently more truth than $T_6$. Whether $T_5$ may even be said to be "more true" than $T_6$ is often disputed. It is often disputed, for one reason, because by standard rules of logic, true theoretical and observation statements, $t_2$ and $o_2$, may follow from or be implied by false ones, $o_1$ and $t_1$, when $t_1$ is taken with $T_0$. Thus if $t_1$ is taken with and defined in terms of $T_0$, then the success of $T_0$ in yielding $t_2$ and $o_2$ never logically establishes the truth of $T_0$. And hence while a specific theory, $T_5$, may have more "relative success" than another, $T_6$, at a given time (ignoring possible future "falsification"), a verification notion of evidence "counting for" the truth of $T_5$, even as compared to $T_6$, is strictly untenable.

If nothing counts for the truth of a theory *per se*, may evidence count against it? It is to be observed that "counting against" *qua* "falsification" will neither strengthen the concept of corroboration nor necessarily render

4. John Worrall, "Scientific Realism and Scientific Change," *The Philosophical Quarterly* (Volume 32, 1982), p. 223.

abandonment of $T_0$ even when not-$o_2$ obtains. In the face of not-$o_2$, auxiliary hypotheses may in principle be generated to either enable $T_0$ to successfully predict $o_2$ or explain why $o_2$ does not obtain. Imre Lakatos, for example, takes Newton to have done this when the latter developed successive models of the sun's planetary system in the face of observational anomalies, rather than falsify his laws of dynamics and universal gravitation.[5] Whether or not this exemplifies avoidance of falsification, which W.H. Newton-Smith challenges, it is generally conceded by Newton-Smith and others[6] that theories are not up for the easy falsifications typically prescribed, for example, by Karl Popper.

If, of course, To has continued and widespread lack of success and explanatory power, then it may simply be partially or wholly abandoned. It is beyond my purpose to elaborate upon recent debates concerning whether the history of science is characterized by the growth of unabandoned commensurable theories which increasingly approximate truth (Karl Popper's "verisimilitude") or rather more by dissimilarities and limited abandonments. My discussion is not primarily concerned with specific theories but rather with epistemological difficulties that in principle attach to the employment of theories and the articulation of their truth-claims. The point I have sought to stress is, in part, that scientific verification, as a criterion for viable truth-claims and meaningfulness, is insufficient for unqualifiedly determining what is or is not properly a statement, tenable theory, or rational belief.

what, in view of the foregoing points, is to render "meaningless" the belief that whatever occurs, occurs because God wills or allows it, notwithstanding that empirical events willed or permitted by God may be partially explained by scientific theories? Is such belief logically absurd or rendered irrational by exhaustive and established ontologies of science? Consider, for example, the belief that God may will or permit a person to flee from a potentially violent situation. The person might be said to be conscious of God's will to flee in terms either of scripture or "urge" of the Holy Spirit. While the person's subsequent running may be viewed as both God's will, and the person's will to be in accord with God's

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5. *The Methodology of Scientific Research Programmes,* ed. J. Worrall and G. Currie (Cambridge University Press, 1983), p. 50.

6. W. H. Newton-Smith, *The Rationality of Science* (Boston: Routledge & Kegan Paul, 1981), pp. 80, 81.

will, the running person may nonetheless be understood kinematically[7] in terms of velocity, distance, and acceleration, say $v=v_0 2+2as$, $s=v_0 t+ 1/2\ at^2$, and $a=v^2 - v_0{}^2/2s$ in the context of "classical" mechanics. Similarly, the social – psychologist's successful use of statistics to predict "x" amount of suicides in terms of some economic index is not inconsistent with saying that the persons in question *chose* death rather than life if certain financial conditions obtain. (Here, of course Hebraic-Christian belief would entail that God does not will what occurs. But his not willing it is not equivalent to His preventing it).

It is alarming, after almost two thousand years of theological and scientific traditions, that one should even have to argue that religion and science are compatible. But the consequences of a secular Enlightenment, summarized by de Holbach's words, "Man is unhappy because he is ignorant of Nature" [*Systeme de la nature* (1770)], has catalyzed an inhumane, hi-tech, scientific culture which is empirically reductive with respect to both nature and human nature. This is evidenced by recent scholarly literature to which I will refer shortly, and by the fact that the West, especially since the tumultuous 1960's, has been characterized by desperate searches for God, self, and the good life. Nonetheless, the most perfunctory glance at the history of ideas shows continuity in understanding both the metaphysical bases of science and the absurd results of neglecting their limitations. Thus, for example, St. Thomas Aquinas' *Summa Contra Gentiles* helped transform a scientific realism of Aristotle, based on a First Mover who was part of nature, to a transcendent God whose creation was inherently intelligible and where God and nature together comprised a dual metaphysical thesis of causation. This view, in which human nature involved a will directed by intellect, precluded an exhaustive causal determinism. Despite Newton's novel formulation of the inverse square law to *describe* gravity apart from immediate reference to its *cause*, causality as a presupposition of descriptive laws remained. This held even though causality was transposed from scholastic notions of being purposive and natural to an invariable mechanical sequence which found critical expression in Hume and Kant. How could law-like behavior of properties, processes, or relations be intelligible independently of causal connections between events? But even contemporary metaphysical interpretations of causal determinism, applicable to relativistic physics and quantum mechanics, are not absolute and *exclusive* assumptions for

7. Cf. Kurt Gieck's *Engineering Formulas* (St Louis: McGraw-Hill Co., 1974), p. L5.

understanding the world. Understanding these limitations is necessary for the intelligibility of science itself. In this respect, the understanding of St Thomas and subsequent scholastics is philosophically deeper and more reflective of ordinary experience than many contemporary views. Misunderstanding the metaphysical limitations of science has been a primary source of society's present crisis.

Insistence that Hebraic-Christian belief necessarily conflicts with scientific truth is neither conceptually tenable nor reflective of ordinary experience, notwithstanding the limitation of scientific ontologies and truth-claims. Surely we would say that the scientist is absurdly myopic, if not naive, if he or she viewed the running person or suicides as mere collections of particles or objects of genetic/environmental conditioning. But myopia is compounded by metaphysical difficulties as well. For one who holds that nature and human nature are exhaustively explicated through deterministic theories must hold that one's own behavior of affirming this truth-claim is itself causally determined. But the same individual must unhappily hold that another's assertion that it is false is equally determined. And if asserted truth-claims are merely caused phenomena, they collapse prima facie as having any epistemic significance. This will be more exactly specified later.

Interestingly, a principle of causal determinism, or alternatively of verification, are precisely the metaphysical principles on which scientific Weltanschauungen are grounded. I have thus far analyzed the limitations of scientific theories and will now turn to their metaphysical bases as putative standpoints for rejecting the Hebraic-Christian religion.

## II. Scientific Weltanschauungen

A "Weltanschauung," for my purpose, constitutes an entire way of looking at the world in terms of one's interests, how phenomena and persons are viewed, and what demands are made on religion, literature, music, science, technology, art, and society in general. A scientific Weltanschauung is therefore a mode of interpreting these, not on the basis of this or that physical theory, but rather on the same or similar metaphysical assumptions that underly them. My discussion shall concentrate on the relationship of such Weltanschauungen to the Hebraic-Christian religion.

The dilemma of those having a scientific Weltanschauung is, in part, that the metaphysical principles, which are supposed for the intelligibility

of scientific inquiry, are themselves neither corroborated by empirical means nor tautologous in the sense of being logically true. And while metaphysical principles involving verification and determinism are corrigible in terms of making them more precise or adequate, their adequacy is proper to scientific endeavors and not *ceteris paribus* to the broad range of human experience. Conflating this distinction is a central error of those who posit scientific Weltanschauungen, despite a host of ontological and epistemological problems that attach to the mere articulation of scientific truth-claims.

Let me now address what I consider to be two scientific Weltanschauungen. The first is grounded on a verification principle and the second on a notion of determinism. Both admit of the truth and meaningfulness of religious belief, but neither paradoxically permits such belief to constitute more than insignificant myth.

## A. Weltanschauungen and Verificationism

My first analysis addresses E.M. Adams' article, "The Accountability of Religious Discourse."[8] It contains varid and interesting insights, many of which I ignore for my limited aim of using the article as an initial foil, As the title suggests, Adams seeks to make religious discourse accountable. But his attempt to make it accountable to science *via* verification reduces all tenable religious talk to that explicable through the physical-metaphysical framework of science:

> While the Hebraic and Christian religions, for example, may make adjustments to accommodate the empirical concepts and findings of modern science without endangering their essential beliefs, they are seriously threatened in their fundamentals by the naturalistic metaphysics generated by modern science. The humanistic metaphysics of religion is logically incompatible with scientific naturalism. whatever counts for the one counts against the other.[9]

On the one hand, Adams argues that the possibility of science counting against the Hebraic-Christian religion enables that religion to be meaningful and relevant. Hence he says that "a religion that

8. E. M. Adams, "The Accountability of Religious Discourse," *International Journal for Philosophy of Religion* (Volume 18, 1985), pp. 3-17.
9. Ibid., p. 6.

was truly immune to human criticism would be irrelevant to human life."[10] But his intention to connect "relevant" to a scientific verification notion of truth is evident in other assertions. Thus, on the other hand he asserts that "if human beings and the lives they live can be located and rendered intelligible in the world defined by the conceptual system of modern science, the fundamental affirmations of the Hebraic-Christian religion are false."[11] These remarks amount to saying, however, that the fundamental affirmations of the Hebraic-Christian religion are relevant or have truth-value if and only if they are false.

Moreover, his suggestion[12] that this religious discourse be understood metaphorically is vacuous, on his own account, since it renders such discourse empty of any verifiable truth-value. This becomes clear when Adams says that metaphorical discourse is not accountable to historical or scientific fact,[13] but that a broad verifiability criterion for truth-claims nonetheless demands comprehension of what would count for or against truth-claims.[14] But if no historical or scientific facts count for or against metaphorical discourse, one wonders what truth-value, and subsequently what meaningfulness, such discourse could have.

What is the difference between Adams' broad construal of verification and a narrow one? Let me briefly answer this question with the hope of clarifying the use and misuse of verification.

The words "counting for or against," as narrowly interpreted by positivists, is broadened by Adams to ostensively be sensitive to the *possible* meaningfulnes of religious discourse. Thus a positivist criterion for truth-claims, in terms of the so-called "analytic-synthetic distinction," was used *inter alia* to dogmatically reject religious "pseudo-statements" as well as to construe proper entry-level statements for transposition into the theoretical discourse of science. Synthetic statements, in the latter context, referred to observation statements where observation terms comprising them were defined in terms of theoretical terms. The defining process was accomplished through correspondence rules, such as $Tx \equiv Ox$, where "T" is a theoretical term, "O" is an observation

10. Ibid., p. 5.
11. Ibid., p. 8.
12. Ibid., p. 13.
13. Ibid., p. 14.
14. Ibid., p. 7.

term, and observation terms refer to specified phenomena or phenomenal properties. Theoretical terms and statements of a given theory were therefore understood as elliptical sorts of observation terms and statements by virtue of such symbolic coordination. Therefore theoretical statements were meaningful because observation statements could be straightforwardly verified by sensory experience. Analytic statements derived their meaningfulness from the definitions of their symbols or words, and as such were logically true (tautologous) or logically false (self-contradictory).

Significantly, the intent of positivists happily converged when correspondence rules simultaneously transposed observation language into theoretical language and prevented the entry of religious discourse into the language of science. All that remained to do was to filter the entire world of discourse through the screen of a correspondence rule. This amounted, of course, to viewing the world through the exhaustive lenses of science. It comprised, in short, a scientific Weltanschauung. Unhappily, the genesis of this worldview in a narrow construal of verification, which Adams appropriately calls "puritanical," was found deficient. Among other things, observation terms were inexact and their potential ontological significance was greater than the exact axiomatic interpretations of theories, as above outlined. Therefore, theoretical statements or terms were not strictly identifiable with observation statements and terms. And thus theoretical statements were not strictly verifiable through observation statements, and theoretical statements were not strictly synthetic. Moreover, theories that were "verified" by empirical data could themselves have no truth-value by virtue of not being statements. This was a serious defect for proponents of positivism, and even for a neo-positivist "Received View" (a name introduced by Hilary Putnam in 1962). For the latter posited a strong scientific realism whereby a central aim of science was to acquire knowledge of how the world really *is*.[15] Finally, the dogmatic construal of verification was an embarrassment, not only because realism involved a metaphysical theory rather than a physical theory, but also because the verification principle was itself neither a synthetic nor analytic statement.

The heart of the difficulty is that positivists did not want a scientific Weltanschauung underlying a verification principle, but rather an unques-

15. Suppe, pp. 648, 649.

tioned verification principle underlying a scientific Weltanschauung. But such a narrow verificationism was bound to bring attention to itself. Would a broader, almost harmless, construal of verification assuage the difficulty? Is, for example, Adams' broader interpretation more helpful in simultaneously supporting a scientific Weltanschauung and rejecting religion? Such a goal, it is to be noted, must appear tolerant of metaphysics and religion on pain of throwing the baby out with the bathwater (verification out with metaphysics and religion). But this is exactly what occurs.

I do not seek to impute motives to anyone or even claim that "resurrection" of the old scientific Weltanschauung is an explicit goal. Rather, I think that our age is burdened with uncritical bias for scientific interpretations of reality that subtly but unwarrantedly reject extra-scientific modes of understanding it.

In any case, a broad verification principle is subject to the same criticism as its puritanical sister. Adams specifies that a putative statement is genuine when one comprehends what would count for or against it; "knows something about how its truth bears on one's belief system and thus on the world."[16] In view of the difficulties of positivism, might the statement "theory $T_1$ is more true than theory $T_2$ because $T_1$ has better empirical corroboration than $T_2$" now have truth-value? It might inasmuch as $T_1$ and $T_2$ are loosely construed as statements describing reality which bear on one's belief system and the world, say for example, concerning whether nature is or is not Euclidean. (Nature's not being Euclidean might bear on one's belief system in the sense of one's rejecting a former unqualified belief that nature is as it ordinarily appears). But this broadened interpretation of verification is *tolerant* of a broader interpretation of scientific and not of religious discourse. Moreover, "truth," whether of theories or statements, still supposes a kind of correspondence between language or parts of language and so-called "empirical reality." Yet this is the very metaphysical "stuff" disputed from Plato's "visible and invisible worlds" and Hume's "sense impression" to Kant's "phenomena and noumena." A scientific Weltanschauung, under the guise of "scientific realism," will not wash just because science is fervently *said* to yield paradigmatic knowledge. Further, does broad verificationism verify itself any more than a narrow one? Or is one to assume that because it is so broad and tolerant, it does not need to be questioned?

16. Adams, p. 3.

Unfortunately, there are no answers to these questions. The difficulty may be stated in the form of a disjunctive dilemma: Either proponents of verificationism believe or do not believe that the principle is true. If they do not believe it is true, then how can putative "facts" or "truth-claims" of science count against those of religion? If they do believe the principle is true, are they not predicating truth of the very unverifiable sort of statement they disparage as having truth-value? Or do they avoid the dilemma by incoherently asserting that the principle is true and not true?

Proponents of scientific Weltanschauungen tacitly affirm such incoherence when they uncritically ignore the ground upon which they stand to exhaustively assess truth-claims. Truth-claims of science can have prima facie no more *metaphysical* value in describing what reality is really like than the metaphysical principle they presuppose. The predictive success of theories may tend to generate belief that those theories are true by virtue of describing and explaining what reality is like. But believing them to be true is no more viable than belief in the truth of a verification principle that itself has no truth-value. I will say more on this later.

It is noteworthy that a broad construal of verification is reminiscent of the very Hebraic-Christian religion it is misused to reject. Thus, Christ admonished the pharisees (Luke 7:33) because nothing would count for or against their disbelief: John the Baptist was austere and Jesus was not austere (drinking wine and consorting with sinners). This does not show that Christ was in spirit a logical positivist. For unlike positivists and their contemporary *epigonos,* Christ did not hide the need for faith and raw belief. Christ's admonition does serve to remind an arrogant and disbelieving age that verificationism is a two-edged sword.

### B. Weltanschauungen and Determinism

A verification principle which stipulates that meaningful truth-claims must have empirical means of being verified or corroborated, presupposes causal determinism. For how could one rely on empirical experience to corroborate predictive theories independently of assuming a regularity of the empirical world in terms of causal connections between events? One would expect that scientific Weltanschauungen would gravitate to such determinism as a natural basis.

An example of a scientific Weltanschauung involving this determinism is Kurt Hübner's *Critique of Scientific Reason.*[17] Its contextualist view

17. Kurt Hübner, *Critique of Scientific Reason,* tr. P. R. Dixon, Jr. and H. M. Dixon (Chicago: The University of Chicago Press, 1985).

of history in general and science in particular seems circularly based on the causal determinism it seeks to explain. What allays suspicion that a scientific Weltanschauung is operant is Hübner's thought-provoking exegesis of scientific theories, his purported allowance for religious truth-claims, and his recognition that any causal principle is *a priori* (neither empirically verifiable nor tautologous). When the "epistemic smoke clears," however, his position is scarcely distinguishable from the "empiricist – rationalist dogma" he decries.

I shall focus on his determinism after briefly summarizing his relativistic and contextualist approaches to history. Importantly, my discussion will succinctly connect Hübner's view with those of physicists Thomas Kuhn and Paul Feyerabend, as well as Karl Marx. For they comprise similar but influentical paradigmatic Weltanschauungen which have pejorative implications for Hebraic-Christian belief.

On the one hand, Hübner rejects the notion that scientific statements or laws can be accepted as mere "facts" or "valid principles." Hence he openly encourages recognition of, among other things, religious truth-claims.[18] On the other hand, the "many pathways to truth" of religion and science are understood by "general structural laws of history" which regard history as historical processes determined by psychological, biological, and physical laws.[19] Thus while Hübner contests the belief that science alone properly monopolizes pathways to truth and reality, he paradoxically argues that, from a *scientific* standpoint, "the very occurrence and rise of the sciences, together with the correlative truths and realities of these sciences, must be considered as something determined by a historical situation."[20] It is not only the history of science that Hübner construes deterministically from a scientific standpoint, but all history, including that of the Hebraic-Christian religion. (It is a *foregone* conclusion that miracles of the Old and New Testaments, much less those reported at Fatima of 1917 and Medjugorje since 1981, must be "scientifically" explained away).

Although he rejects strict determinism in terms of causal or numerical (physical or mathematical) sequences, he says that his structural laws are based on a *"purely logical analysis* of science and the manner in which

18. Ibid., pp. XI, 106.
19. Ibid., pp. 114, 115.
20. Ibid., p. 124.

science regards its own history as well as any history whatsoever" (his emphasis).[21] Hübner's apparent tolerance for religious belief seems intelligible here when he concludes that the empiricist-rationalist bias of our scientific age was determined by our age's need to eliminate inconsistencies of another age's worldview. "Age" can be understood as "historical situation" or "historical context," and hence I partially refer to his position as "contextualism." But it is ironic that Hübner seeks the "demystification of science" by assuming the science he seeks to demystify.

Indeed, "demystification" is a much abused word in the post-Nietzschean West, and is reminiscent of attempts to denounce everything from a feminine mystique and sexual behavior to, most especially, religion. It is not therefore surprising that Hübner speaks of spiritual-intellectual upheavals which resulted in the dissolution of the "Christian-mythical worldview;" of historical shifts from simple notions of above (heaven) and below (hell) to homogenous or isotropic assumptions of nature underlying relativity physics or quantum mechanics.[22]

As with the misuse of scientific verification, one again witnesses the reduction of all language to language about empirical nature. How could it be otherwise that such misuse will occur when one seeks to construe all human experience in terms of how "science regards its own history as well as any history whatsoever?"[23] For, as I will expand upon shortly, causal determinism is a necessary presupposition of science, and science *via* verification is inextricably reductive in grounding all language on sensory experience.

I now note that the notions of "heaven" and "hell" were, of course, never understood by the apostles as scientific descriptions the meanings of which were relative to varying historical contexts. When the apostles in the New Testament or Christians today speak of heaven above, they refer to a spiritual place where God resides and not to another empirical world. There are everyday assertions, say "the sun is rising," as well as religious ones, which perdure independently of shifting scientific contexts. But this seems entirely ignored in Hübner's deterministic contextualism. When common persons asserted in pre-relativistic physics that the sun rises, can they not simply have meant that it is time to get up? Were

21. Ibid., pp. 115, 124.
22. Ibid., p. 151.
23. Ibid., pp. 115, 124.

they necessarily postulating scientific descriptions of the relative motions of heavenly bodies? Everyday language as well as religious discourse are not merely pre-scientific in the sense of being primitive empirical state descriptions which attach to some unfruitful pre-axiomatized theories of nature. Therefore such discourse is not subject to verification or causal principles that are formulated in the first place to clarify the intelligibility of scientific discourse. Is metaphysical discourse presupposed by science, for that matter, the same as scientific discourse? Does the former discourse also change with historical periods? If so, one wonders how Hübner could construe history deterministically from a scientific perspective.

My criticism of Hübner is timely in view of the actual or possible impact of similar positions, including Kuhn's and Feyerabend's, on a so-called "liberated theology." I will briefly consider this connection after examining how Hübner's contextualism is related to an epistemic relativism.

His contextualism understands "good," "bad," "true," and "false" as notions wholly relative to changing historical rules. The latter are themselves determined or caused by anomalies which are compared to the "historical evolution" of a card game:

> Let us assume that some people are playing cards. The rules of the game will then determine what is true, good or bad . . . Now assume further that there are certain inconsistencies in the rules. They will change the rules; along with this what is true and false, good and bad, in the game will also change.[24]

Thus Hübner says, for example, that it is senseless today to assert that space is or is not Euclidean, but meaningful to say Euclidean nature was well-grounded in the Renaissance. (In the same way, it would be presumably senseless to assert in one version of cards that a certain suit is or is not trump, but meaningful to say it was trump in an earlier version). Similarly, one might suppose by Hübner's analysis, that it is senseless for Christians to assert today that homosexuality is or is not immoral. But it would be presumably meaningful to say the immorality of homosexuality was well-grounded in St. Paul's Rome of 56 A.D. This assumes, of course, that the Hebraic-Christian religion has not been exhaustively demystified by a science which is itself being demystified.

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24. Ibid., p. 210.

It should be observed that Hübner is not speaking of a positivist notion of "senseless" in terms of a pseudo-statement lacking possible verification. Rather, by his own analogy, "senseless" is viewed in light of varying rules which determine truth, and rules which are themselves determined by inconsistencies similar to those generated in a game. But if it is true in one version of a game to assert that a suit is trump, would it not be simply false in another version to state this? Would we ordinarily say *of* one's question in one version, "Is or is not this suit trump,?" that it is senseless? I suggest that we would in fact assert that it is not the case that it is trump. That is, it is false to say it is trump.

It is not surprising that Hübner, following the troubled heals of Kuhn and Feyerabend, replaces "false" with "senseless" when so doing is nevertheless inappropriate. Kuhn and Feyerabend held that truth is relative to incommensurable scientific revolutions and theories respectively. Thus Einstein would be unable to agree with Newton about the meaning of the observation term "red," much less the theoretical term "mass," by virtue of viewing the world through incomparable paradigms or theories in history. Moreover, both the positions of Kuhn and Feyerabend entail that persons are caused to interpret phenomena in terms of changing paradigms (disciplinary matrixes) and theories respectively.[25] Therefore both view human nature as well as nature deterministically (scientifically). In short, they share similar scientific Weltanschauungen by which paradigms or theories determine incommensurable notions of truth. But a particularly knotty problem ensues which renders such contextualistic and relativistic theses trivial unless incoherent.

The difficulty of the thesis that truth changes from age to age, period to period, theory to theory, or epoch to epoch, may be formulated in terms of the sentence, "It is possible that statement 'S' is true in

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25. The "later Kuhn" speaks of disciplinary matrixes, e.g. models, exemplars, and symbolic generalizations, as conditioning scientists to view phenomena certain ways and of scientists or students as being "programmed." See his "Second Thoughts on Paradigms," Suppe, pp. 474-475. Feyerabend speaks of observers being "caused to accept or reject" *uninterpreted* (observation) sentences in response to sensory phenomena, where such sentences are interpreted as observation statements in the context of a theory. See Suppe, p. 637. My criticism is that if conceptual activity and language are theory-dependent, as Feyerabend argues, then uninterpreted sentences that persons are caused to accept (reject) are themselves already theory-dependent. This entails that persons are caused to accept (reject) and interpret phenomena in terms of theories. *The Structure of Scientific Theories* nowhere seems to criticize such scientific (deterministic) construals of human beings.

"$\theta$" and false in "$\psi$," where "$\theta$" and "$\psi$" refer to whatever it is to which truth is relative.[26] The sentence may mean that the same statement "S" has different meanings in different historical contexts. But if all the sentence asserts is that "S" with different meanings has different truth values, and if this is necessarily the case, then the sentence is trivially true. But if "S" in $\theta$ and $\psi$ expresses the same statement, say p, then the sentence is incoherent. For if "S" in $\theta$ and $\psi$ expresses p, then "S" in $\theta$ and $\psi$ has the same truth conditions. And if the conditions for what make "S" true or false are identical for "S" in $\theta$ and $\psi$, then it is incoherent for "S" to be true in $\theta$ but false in $\psi$. Hence the sentence is trivial unless incoherent, and Hübner's thesis, as well as those of Kuhn and Feyerabend, are thus incoherent if not trivial.

It is beyond my scope to elaborate upon similarities between Hübner's relativism and those of Kuhn and Feyerabend. But given their real or potential impact on the Hebraic-Christian religion, it seems appropriate to mention some connection.

Despite Hübner's self-proclaimed disassociation with Kuhn, one suspects that such positions challenge the Hebraic-Christian religion, in a unique way, on everything from "gay rights" and militant political activism to the ordination of women and the very divinity of Christ.[27] The thesis of relativism, whether of Hübner's varying historical rules, Kuhn's revolutionary paradigms, or Feyerabend's incommensurable theories, lend themselves to a "liberation theology" in which all scriptural discourse is relative to incomparable cultural revolutions. For it is such radically incomparable contexts that comprise kinds of worldviews through which all experience is filtered (interpreted). Just as incommensurable theories or scientific revolutions putatively determine incomparable meanings of scientific language, so they radically alter the meanings of the words of the prophets, apostles, and God Himself (or Herself, depending on one's historical context). That is, Hebraic-Christian belief may be "liberated" from outmoded historical interpretations. In this manner of liberated interpretation, the very words of *Revelation* (22:18,19) become vacuous:

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26. See Newton-Smith, pp. 35, 36, on which this is based.

27. This is not to deny that some scriptural exegesis or hermeneutics may intelligibly challenge some areas of traditional Hebraic-Christian belief. My point is that any analysis becomes relative to and determined by a given cultural praxis in this context.

> I myself give witness to all who hear the prophetic words of this book. If anyone adds to these words, God will visit him with all the plagues described herein! If anyone takes away from the words of this prophetic book, God will take away his share in the tree of life and the holy city described here!

The relativistic thesis would add to and take away from such words or similar ones, not literally, but under the guise of a radical *scientific* hermeneutics which renders the author's intention and meaning meaningless. Moreover, God's eternal unchanging word or the "word becoming flesh" now paradoxically become the same yet incomparable words of incommensurable cultures. But this means that the *changing* meanings of the words of God, the prophets, and apostles are paradoxically supplanted by the *unchanging* meanings of the words which comprise radical theories of meaning for science. When, for example, Professor Kathryn Parsons asserts that Kuhnian paradigms provide the "epistemic rationale" for continual revolutions in science and morality,[28] does she not wonder whether Kuhn's own words are merely relative to *his* historical paradigm?

There seem to be inescapable similarities to Karl Marx. Indeed, Marx's thought may constitute *the* paradigmatic scientific Weltanschauung which influenced subsequent ones.[29] Marx thought that all thought is relative to and determined by historical epochs.[30] Further, he construed his dialectical materialism and history as comprising scientific rather than metaphysical (philosophical) analysis. Hence, for example, the philosophical thought of Marx was understood by Marx to be scientific when he asserted *a priori* that all history is the history of class struggle. Is there any doubt that Marx provided an epistemic rationale, not only for straightforward scientific Weltanschauungen, but for contemporary social-political attacks on Hebraic-Christian belief as well?

Class struggle might today be politically interpreted by some radical feminists, following Marx, as gender struggle between males

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28. Kathryn Pyne Parsons, "Nietzsche and Moral Change", from *Nietzsche*, ed. R.C. Solomon (New York: Anchor Press, 1980), p. 192.
29. See Hübner, p. 258, f. n. 8. Hübner succinctly criticizes Marx for foisting "a structure onto history as a whole that has been extrapolated from a description of a system which pertained merely to one particular epoch – the so-called First Industrial Revolution . . .".
30. See Karl Marx and Frederick Engles, *Manifesto of the Communist Party*, authorized English translation (New York: International Publishers, 1968), pp. 6, 26–28.

and females. This struggle may have the goal either of liberating (eliminating) gender distinction in the context of a bourgeois religion wedded to capitalism, or retaining religion but reconstruing it in "nonsexist" language. The first alternative would simply view the Hebraic-Christian religion as a passing phenomenon in dialectical history. The second might reinterpret, among other things, God as Mother or Person, and God the Son as the Human One.[31] (While philosophically critical assessments of such positions, as any others, should be welcomed by academia, such analyses are conspicuously absent. Does this reflect philosophical certainty underlying such political positions, political certainty underlying philosophical assessments, or lack of "Socratic courage" in an unfavourable political climate which conflates "anti-women" with critical analysis?

The effects of the second alternative on scripture, where both Yahweh relates to Israel (e.g., *Hosea*, *Jeremiah*) and Christ relates to church *(Ephesians)* as husbands to wives, are virtually to undermine the meaningfulness of the Old and New Testaments. It has in fact reuslted in defending Jesus and St. Paul, as well as others, from charges of being chauvinists.[32] It amounts, moreover, to the reduction of Hebraic-Christian expatiation from inspired to human (male-dominated) truth, thought, and language. Michael Levin's *Feminism and Freedom* (1987)[33] is one of

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31. Michael Levin, *Feminism and Freedom* (New Brunswick, New Jersey: Transaction Books, Rutgers – The State University, 1987), pp. 251, 252. I recall in church several years ago, on Mother's Day, that a minister said unqualifiedly that it made no difference whether we understand God as Father or Mother. In some ultimate theological sense this may be so. In an ordinary scriptural sense it is not so inasmuch as Christ Himself spoke of God the Father. If we accept "Mother" we may as well accept Christ as Daughter and man as woman throughout scripture with no "Slippery Slope" fallacy involved. Notwithstanding that we are all "one in Christ" spiritually, one wonders why *Genesis* distinguished between Adam and Eve, Yahwey is the "husband" of Israel, and Christ has the church as His "bride," where such distinctions are accompanied by distinctive behaviors in terms of gender.

32. See "Was Jesus a Chauvinist?" and "'I Commend Unto You Phoebe' – Paul," from *What You Should Know About Women's Lib*, ed. Miriam G. Moran (New Canaan, Connecticut: Pivot Books, 1974), pp. 18–24 and 89–96 respectively.

33. Levin, pp. 186–189. Levin also says (p. 26):

> To be sure, feminists are attracted primarily to the ideas that the Soviet state proclaims itself as embodying, rather than to the Soviet regime itself, but with that understood, a great many well-known feminists, including de Beauvoir, Millett, Firestone, Bleier, Mitchell, Chodorow, Mackinnon, Steinem, Sheila

the few rigourously asgued works which courageously addresses this issue. While Levin, s scholar in the philosophies of science and mathematics, does not analyze the influences of Kuhn, Feyerabend, or Hübner, he acknowledges the scarcity of critical literature which deals with an epistemic relativism and Marxism inherent in a radical feminism. I note that insofar as truth, language, and thought are viewed as mere political instruments of class struggle, any rational assessment of such a feminism would be subject out of hand to the criticism that it is merely part of the political struggle. This precludes *a priori* any critical evaluation as sexist, chauvinistic, or reactionary.[34] Inasmuch as truth, thought, and language are perceived

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Rowbotham, Margaret Benston, Angela Davis, Eli Zaretsky, Evelyn Reed, Barbara Ehrereich, Vivian Howe, and Rayna Rapp identify themselves as socialists or Marxists of some sort. According to Germaine Greer, "the forging-house of most of the younger women's liberation groups was the university left wing."

The reference to Greer is supported by I. T. Sargent, who identifies much of recent feminism with ideological roots in the New Left, a name first used by liberal Marxists centered around the *New Left Review* in 1959. The name "New left" was then, according to Sargent, "appropriated by the growing world student movement and mass media in the mid-1960's." See Sargent's *Contemporary Political Ideologies,* 7th Ed. (Illinois: The Dorsey Press, 1987), p. 149.

34. See Levin, pp. 205, 206. He notes that:

Many campuses permit the use of facilities by feminist organizations that keep confidential files on "sexist" professors. Male academics above all seem disposed to interpret the initiatives of their feminist colleagues as temporary distortions of a fundamentally sound idea. These male academics assume that their feminist colleagues share an allegiance to the values of free inquiry that would, in a showdown, lead them to subordinate their ideological agenda to the preservation of institutional autonomy. This is a mistake. Adherents of an ideology which repudiates objective truth can be expected to shape their research for political ends, and academic feminists have not hesitated to advocate just this course. According to a joint resolution of the Coordinating Committee on Women in the History Profession and Conference Group on Women's History of the American Historical Association: "We believe as feminist scholars we have a responsibility not to allow our scholarship to be used against the interests of women struggling for equity in our society." A number of feminist historians have urged that it not be said publicly that women tend to make different life choices than men, *even if this is true,* lest the "political consequences" of such candor be adverse to their goals.

Interestingly, in a recent "APA Proceedings," the eminent philosopher, Sidney Hook, himself a former spokesman for Marxism, seemed to underscore Levin's concern:

One of the greatest dangers I forsee to freedom of philosophical inquiry and to the principles of academic freedom generally is the growing politicalization of the university. This began in the mid-sixties when institutions of higher

as only modes of political behavior determined by historical praxes, such a view comprises a scientific Weltanschauung.

This criticism is not "anti-science" or "anti-feminist." What genuinely reflects "anti-science" are views by scientists and philosophers of themselves as mere parts of a causally determined nature. It is not only degrading but logically incoherent as well. What would reflect "anti-feminism" are attempts to ground *humane* concerns of women on a pseudo-scientific ideology [35] which views women, not as rational decision-making persons, but as determined ("conditioned") phenomena of historical epochs. Such attempts would ironically belie lack of faith by women in the ability of women to articulate goals independently of a closed ideology which promotes conflict, hatred, and propaganda. But the latter, which are not shared by most women or many feminists,[36] only parodies the very injustice and totalitarian thought that feminists sought to overcome in the first place.

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education as corporate bodies took public positions on controversial social and political issues not germane to their academic mission.

See *Proceedings And Addresses Of The American Philosophical Association* (Volume 60, Number 3, 1987), pp. 511, 512.

35. See Levin, pp. 22, 23. Levin refers to Claire Fulenwider who empirically tested the claim that feminism functions as an ideological belief system. In her *Feminism in American Politics* (New York: Praeger, 1980), Fulenwider held that "radical, socialist, and reform" feminism alike function as a political ideology (a system of beliefs as opposed to attitudes). This ideology describes and explains reality, as well as prescribes ways of changing it. The problem for Levin, and presumably for Hook mentioned above, is that incorporation of many feminist ideas into institutional policy tends to discourage if not forbid philosophical analysis of that ideology or philosophy, I have, of course, explicated the basis of ideology in my context in terms of scientific Weltanschauungen.

36. See *Feminist Frameworks: Alternative Theoretical Accounts Of The Relations Between Women and Men,* 2nd ed., ed. by Alison M. Jaggar and Paula S. Rothenberg (St. Louis: McGraw-Hill Book Co., 1984). This work evidences the diversity of feminist thought. Jaggar and Rothenberg summarize contemporary feminists (pp. xiv, xv):

> All agree that it is necessary to end sexual harassment, rape and physical abuse of women; most agree that women should have sexual and reproductive freedom to the extent of having access to contraception and abortion and should be able to choose a sexual partner of either sex; and all contemporary feminists agree that women should have the opportunity to participate fully in so-called public life. Beyond these basic agreements, however, sharp differences between feminists emerge. Does feminism require lesbianism? Does it call for the abolition of marriage? Does it even require the end of the capitalist system?

One is vividly reminded of Albert Camus who warned a world plagued by Stalin's purges and Hitler's concentration camps to accept the *human* side of justice. Camus, to the wrath of Parisian intellectuals, rejected the ideological side which, in the abstract passions of the political Left and Right, had mutilated so many men and women. Heroic women of the New and Old Testaments, from Eve, whose essential offspring was Christ, to Sarah, Ruth, Judith, Esther, the Virgin Mary, and Phoebe, are scarcely dignified by scientific Weltanschauungen that reduce their behaviors to determined responses of male-dominated cultural praxes.

The fundamental question for scientific Weltanschauungen and their political offspring concerns whether Marx's, Kuhn's, or Hübner's assertions about history are themselves determined by historical epochs, paradigms, or rules. The paradoxical thesis of epistemic relativism is inextricably linked to a causal determinism in these cases. If there was no sort of causal connection between and within different historical periods, then "revolutions," "inconsistencies," or "paradigms" would be insignificant as connectives between such periods and determinants of subsequent conditions for truth-claims within them, *ascertainable* through scientific analysis. The frequent denial that Marx posits a "mechanistic determinism"[37] does not obviate the fact that, insofar as he construes history scientifically, he supposes a causal determinism whether of potentially exact or inexact measurement. The notion of inexact measurement does not suppose quasi-science anymore than inexact measurements of quantum mechanics suppose that it is not science. Either Marx and proponents of scientific Weltanschauungen are doing science or not. If they are not, then this should be clearly stated. They should openly affirm the bourgeois or dogmatic philosophizing they pretend to spurn. The latter is preferable to their present difficulties.

I formulate a central difficulty which ensues by letting "p" represent the statement "an historical period determines truth-claims within it." If S's claim that "'p' is true" in $\phi$ and R's claim that "'p' is false" in $\Omega$ are determined in $\phi$ and $\Omega$ respectively, where $\phi$ and $\Omega$ symbolize different historical periods, then S's claim is true. S's claim that "'p' is true" in $\phi$ is true, however, if and only if R's claim that "'p' is false" in $\Omega$ is

37. See, for example, Martin Hollis' *Models of Man: Philosophical Thoughts On Social Action* (New York: Cambridge University Press, 1977), pp. 17, 18, or Thomas Flynn's *Sartre and Marxist Existentialism* (Chicago: University of Chicago Press, 1986), pp. 73, 200.

true. But this entails the logical incoherence that p is true if and only if p is false. For there are no truth-conditions independently of determinants $\Phi$ and $\Omega$ for assessing the truth-value of p. The objection that incoherence is avoided by virtue of p having different meanings is $\Phi$ and $\Omega$ is of no avail. For if p has different meanings in $\Phi$ and $\Omega$, then S's claim and R's counter-claim concerning p are meaningless outside historical periods $\Phi$ and $\Omega$ respectively. Thus p, which means an historical period (epoch, rules, or paradigm) determines truth-values within it, can have no relevance to the very historical periods that Marx, Hübner, or Kuhn address. And hence their claims can paradoxically be meaningful construals of history only by being logically incoherent.

The difficulty of determinism is, of course, related to that of epistemic relativism. I will not expand except to say that while deterministic notions of truth suppose prima facie epistemic relativism, not all theories of epistemic relativism suppose deterministic construals of truth. Although relativism tends to proceed *pari passu* with determinism, it is conceivable that relativism might be based on varying agreed upon meanings of truth in terms of the way words are used, or on pragmatic (instrumentalist) conceptions of truth, wherein, say, a statement or theory is "true" by virtue of its value (utility) in rendering varying desired results or predictions. How the former could avoid trivially true statements or the latter could function independently of assuming a correspondence between predictive statements and reality in order to corroborate utility are questions beyond my present purposes. My analysis of determinism emphasizes that the persons addressed must incoherently understand claims and counter-claims about history, not merely as relative truths, but as behavioral phenomena caused by determinant historical periods.

The contradictory consequent of construing history deterministically is exacerbated by the fact that, following Kant's formulation, the notion of determinism is generally conceded to comprise a *synthetic a priori* judgement. It is *a priori* in the sense that the judgement, understood as a causal principle, "every event has a cause," is necessarily presupposed for the intelligibility of scientific inquiry independently of experience. Thus it is not derived from experience *(a posteriori)*, but is the very precondition for scientifically experienced phenomena. The principle is *synthetic* in the sense that the idea of "cause" is not contained in that of "event." Therefore its necessity is not of an *analytic* (logically necessary) sort. (Follow-

ing Hume, there is no "necessary connexion" between events.) Hence the principle, formulated and understood conventionally, "for all exactly or inexactly measurable events, there are other events, simultaneous, past, and future, to which it is connected by means of causal laws," is neither tautologous nor empirically verifiable.[38]

And thus the principle which itself has no logically necessary or contingent truth-value, is the necessary but metaphysical (philosophical) basis of truth-value in the employment and articulation of scientific theories. This holds prima facie for quantum mechanics as well whose equations may be deterministic of probabilities. But the principle is not the necessary basis for truth-value in the employment of theories to explicate history or even the history of science. The contumacious attempts to so construe it result in incoherent scientific Weltanschauungen.

In conclusion, there are inherent epistemic difficulties attaching to truth-claims indigenous to the empirical and theoretical employment of scientific theories. This alone precludes dogmatic juxtaposition of such claims to religious ones. Moreover, such claims can have, on the face of it, no more metaphysical significance concerning what reality is like than the metaphysical principles such truth-claims presuppose. This means that while the successful employment of theories tends to invoke belief in the truth of such metaphysical principles, "belief" is not to be conflated with some sort of weak knowledge having truth-value. Such "belief" is not epistemologically significant in the sense, say, that S rationally believes P if and only if "P" is true and S has adequate evidence that P.[39] For this already presupposes a metaphysical belief for which there is no evidence.

It is this nonepistemic (nonrational) belief I address and which I compare to faith, or if that is uncomfortably close to religion, to expectation. Perhaps, one might say, some scientists and philosophers believe that metaphysical principles are true in the sense that they simply expect nature

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38. Cf. Hübner, p. 14. My definition alters his by including inexact measurement. Hübner nevertheless agrees in principle that such measurement may be included.

39. This construal of belief attaches to the notion of justified true belief. See Suppe, p. 717, on the so-called "K-K Thesis."

to behave deterministically.[40] I have no quarrel with expectation, if it is simply admitted to be that. My quarrel is with those who conflate physics with metaphysics and who disparage a religious tradition that is as viable as the scientific tradition they render incoherent.

40. See the paper of physicists F. Rohrlich and L. Hardin, "Established Theories," *Philosophy of Science* (Volume 50, 1983), pp. 603-617. In defending the notion of an historically generated sequence of successful theories against a skepticism that they might all turn out to be false, they speak of nature itself as having to radically change. One supposes that Rohrlich and Hardin *expect* nature not to so change. But what evidence could be forthcoming to support such expectation?