Immanuel Kant and the 'New Age' kookery

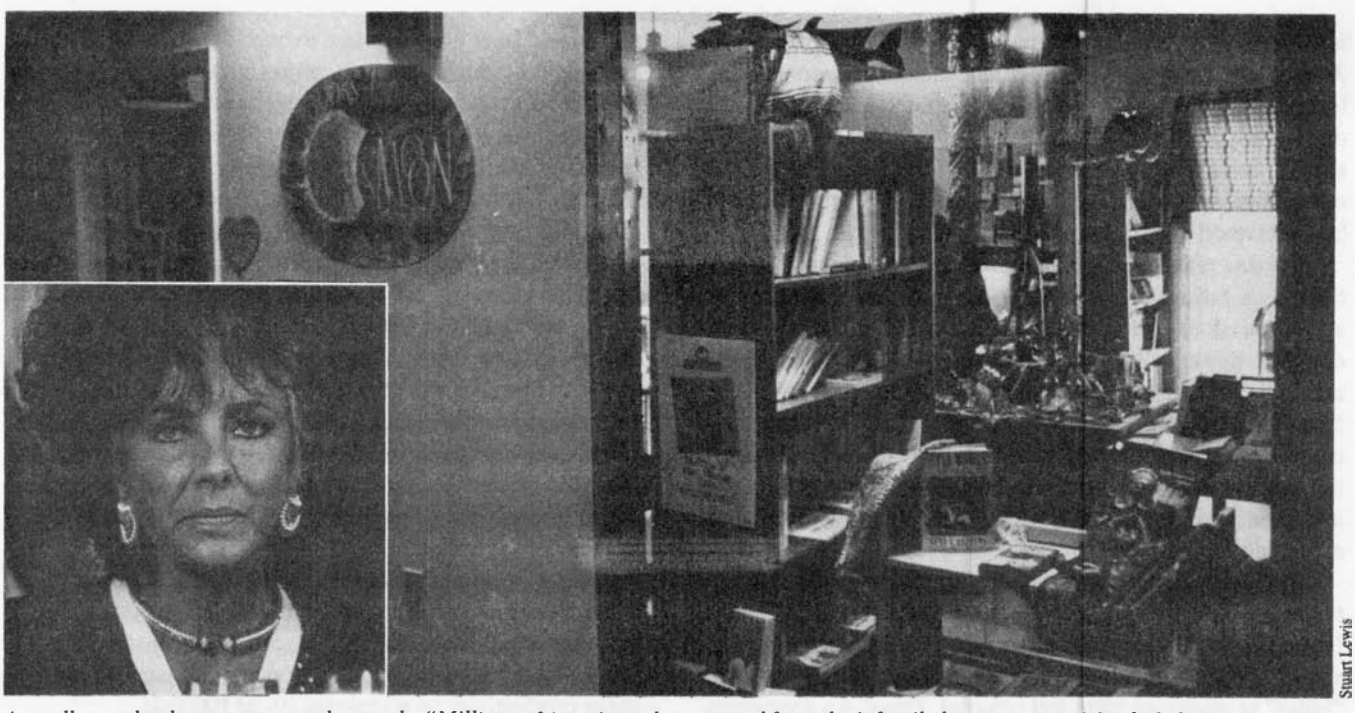
by Lyndon H. LaRouche, Jr.

The *New York Times* of May 1 features a Sunday Magazine section article, "Colorado's Thriving Cults," by Fergus M. Bordewich. Witches, magicians, and kindred sorts of unwholesome folk take the place of beings from outer space, in a real-life version of the old Hollywood horror film, "The Invasion of the Body Snatchers." According to the *Times'* account, a significant ratio of the population of that state is being turned into zombies under the control of "New Age" satanism.

Growing numbers of Americans have moved from the infantile hocus-pocus of the daily horoscope, into some extremely lunatic stuff. Not only Americans: During 1986, Hollywood's Elizabeth Taylor had sponsored a satanist rock festival in Turin, Italy, until the local authorities canceled the atrocity. In the same year, the Governor of Massachusetts, Democratic presidential candidate Michael Dukakis, appointed Salem's leading local necromancer, Laurie Cabot, as the official state witch. Must we expect Saturday night black masses in a Dukakis White House next?

In broad terms, the sources spreading these satanic "New Age" cults are easily exposed. The cults were spawned from Britain by the same satanist, Aleister Crowley, who was the leading figure of the international theosophical movement during much of the present century. Crowley professed his satanism openly. Like his co-thinker Friedrich Nietzsche, he insisted that the twentieth century would see the end of the "Age of Pisces," which he identified with the image of Socrates as well as Jesus Christ. He prophesied the coming of the "Age of Aquarius," which he and Nietzsche associated with the worship of such satanic figures as Dionysos and Lucifer.

Crowley was a leader for those spreading various forms of satan-worship internationally. Aldous Huxley was among Crowley's recruits to the cult, and both H.G. Wells and Bertrand Russell were Crowley allies. Most of this sort of mystical satanist refuse proliferating in the United States today, is a direct result of the missionary work of Crowley followers, working in Britain and the United States, including the recently deceased, Episcopal Church-sponsored Gregory Bateson.



A small-town bookstore caters to the occult. "Millions of Americans have moved from the infantile hocus-pocus of the daily horoscope, into really lunatic stuff." Inset: Hollywood promoter of satanism, Elizabeth Taylor.

The principal factor directly fostering susceptibility to these cults has been the rock-drug-sex counterculture. The creation of the Beatles was itself a project of Crowley's sordid crew; "satanist messages" are embedded in the explicit lyrics and also in some subliminal "messages" planted in recordings of their work. Most of the leading rock groups are products of similar sponsorship, who use the same explicit and subliminal satanist propaganda in their trade.

Even without the satanist messages, repeated heavy dosages of hard rock have a destructive physiological impact upon the mental processes of the fan. When the heavy use of rock is combined with "recreational substances" altering of mental states, a significant deterioration of the mental capacities and personal character is to be expected.

At the same time, more and more people are being affected by a spreading and deepening cultural pessimism, caused by the trends of developments during the recent twenty years. The process has marked similarities to the massive outbreaks of witchcraft cults in Europe during the fourteenth century, and again during a period of approximately a hundred years from the middle of the sixteenth century until the beginning of the new renaissance unleashed by the British and French allies' 1653 defeat of the Hapsburgs.

Those general observations noted, our subject here is a single contributing factor in the spread of satanic cults. Put the obvious human wreckage of the rock-drug-sex counterculture to one side; let us concentrate our attention on the kinds of lost souls Bordewich portrays in his *Times* feature. We focus our attention on the victim of these cults who appeared a rather normal and rational individual up to the time of his or her recruitment. What are the mechanisms which permit an apparently normal and rational person to be taken over by lurid superstition, like some Hollywood horror film's victim of the "Body Snatchers"?

In speaking of such cults, it is useful to keep in mind those superstitious folk who organize their lives around their horoscopes, or bet their faith in "luck" on games of chance.

Our attention is focused on the fact, that among many persons whom we might class ordinarily as rational, there is a mental flaw, typified by the error inherent in formal deductive logic. Ordinarily, this flaw may appear to have very little practical significance in assessing the person's behavior as a job applicant, for example. Under appropriate circumstances of psychological stress, what might have seemed earlier to have been this mild flaw in their intellectual development, may become a central feature of a sick personality. In relevant cases that flaw may lead such a person to become another dupe of the kind of cult referenced by the *Times'* feature.

We shall identify that flaw as the fundamental error in the system of the philosopher Immanuel Kant.

Rational is not always real

It used to be generally accepted, at least very widely so, that the essence of science is providing experimental proof for some mathematical theorem. This "mathematics" is usually understood to be a branch of formal deductive logic. To the extent science relies upon that, the most important phys-

ical phenomena can not be understood in a rational way. Admittedly, most of the simpler mechanical phenomena can be understood, at least to the degree that any errors are not particularly noticeable in practice. It is the most fundamental sort of scientific problems—those phenomena which the mathematician usually labels as "nonlinear"—which can not be understood in a formal-deductive way.

For this reason, what academic teaching generally identifies as a rational way of thinking works sometimes, and sometimes does not. If science is dominated by formal-mathematical thinking based on only deductive and inductive methods, the fabric of scientific knowledge as a whole is filled with many holes—or, what mathematics terms "discontinuities." It is through these "holes" in deductive reasoning that the wild irrationalism of belief in horoscopes, luck, and even witchcraft, may penetrate the victim's mind, and even pretty much take it over.

In these matters, what is generally taught as psychology today is useless. Granted, the psychoanalysis of Sigmoid Fraud is a very clever concoction which might be helpful to some to a limited degree, but in the matters bearing upon the "holes" to which we have just referred, Freud is a dangerous quack, and most which passes for professional psychology is overgrown by a thick fungus of elementary fallacies.

Psychology is a creation of the middle of the nineteenth century, along with ethnology-anthropology and sociology. Worse, the introduction of modern psychology, by the French positivists and others, had the effect of distracting attention away from a very well developed knowledge of the characteristics of the human mental processes which had been accumulated under the heading of philosophy over thousands of years.

For example, Dante Alighieri's famous *Commedia* is a masterwork in the science of the human mind. The classical works in a field called epistemology, constitute a study of the way in which the human mental processes have worked over a period of centuries. The problem of "holes" was rather well understood by leading philosophers into the early nineteenth century.

Not only do the writings of the famous Immanuel Kant illustrate very well the nature of the problem also found in the work of René Descartes and many others. Kant contributed influentially to the rise of irrationalism during the nineteenth century. Many today could blame the black holes in their rationality upon the very extensive influence of Kant.

Now, we shall proceed to describe the nature of the problem we have isolated for scrutiny here.

Kant's central fallacy

For the sake of simplifying our task, let us assume for a moment that mankind's early condition was more or less that which the anthropologists name "primitive hunting-and-gathering society." If mankind ever lived in such a condition, an average of about 10 square kilometers of wilderness land-area would have been required to barely sustain the life of an average individual, placing a ceiling upon the Earth's human population at about 10 million persons at any one time.

Last year, it was widely reported that the population had surpassed 5 billion persons. If there were global use today of the levels of technology developed about the beginning of the 1970s, we could sustain at least three times 5 billion persons at an average standard of living better than the average in the industrialized nations at the start of the 1970s.

So, mankind has increased its raw potential population-density by approximately three decimal orders of magnitude above the level of what the anthropologists portray as primitive man. From the standpoint of a special branch of physical science, known as physical economy, we also know that the frontiers of scientific technology today have the clear potential to increase the productivity and average income of persons in the United States tenfold over the course of the coming two generations. From the standpoint of a next layer of scientific discovery, the mastery of what we term today "matter-antimatter" reactions, we already know that during the second half of the coming century, we can increase the average productivity an additional 10- to 100-fold.

No species of animal, during the entire span of its existence as a species, could improve its potential population-density by even a tiny fraction of a single order of magnitude. We know that the increase in man's power to exist is the outcome of what we call today scientific and technological progress. This progress is the result of a potentiality of the individual human mind which is lacking in the beasts, a potentiality typified by the capacity of individuals to generate and to assimilate valid fundamental discoveries in physical science.

This difference between human beings and beasts, is the essence of human psychology. Thus, psychologists can learn nothing of man from the study of animal behavior, but how to degrade human beings to the level of behavior of beasts. Once we recognize this essential difference between human beings and beasts, we are confronted directly with what is key to understanding the nature of those "holes" through which seemingly rational persons are sucked into New Age kookery.

Our culprit, Immanuel Kant, was a Pietist in religion, a Prussian of Scottish-immigrant parentage who devoted his adult life to attempting to destroy the influence of Gottfried Leibniz. In his early academic life, Kant was the leading German academic exponent for the empiricist irrationalism of David Hume. Even after he refused to follow Hume's later shift into overtly immoral radical empiricism, Kant's famous *Critiques* continued his life-long commitment to destroying Leibniz.

Kant was a fanatical defender of the notion that the only form of rational thought and argument is the radically formal deductive method. Otherwise, the central feature of Kant's entire work and later influence of his teachings is a thesis

which occupies the center of his last book, *The Critique of Judgment*. That book says nothing different than Kant had argued in earlier writings; it repeats that point more flagrantly. His argument, which is essentially a parody of René Descartes' view earlier, is the key to the way a seemingly logical mind is lured into fanatical adherence to some outrightly satanic cult.

The center of Kant's argument, from the *Critique of Pure Reason* through the *Critique of Judgment,* is that there exists undeniable proof that creation has occurred, but that the idea of a process of creation is beyond the capacity of the human mind. In arguing so, Kant gave a defense of irrational mysticisms. Thus, Kant supplied us a road-map of some of the crucial things which have occurred inside the mind of a formerly well-behaved, rational person, to transform that person into an adherent of astrology, of gambler's luck, or even of a Crowleyite sort of satanic cult.

Look at Kant's supposed proof in the language of modern logical positivism.

All formal logic is based on pure deduction. Any system of formal logic begins with certain arbitrary assumptions which have been adopted without proof, adopted so on the presumption that the truthfulness of those assertions is self-evident. The axioms of schoolbook Euclidean geometry are an example of this. In addition to such axioms, a strict deductive logic includes axiom-like assumptions called "postulates," axiom-like assumptions adopted to hold the system together at points the axioms alone would otherwise lead to obvious sorts of paradoxical uncertainties.

In pure deduction, the logician begins with such a set of adopted axioms and postulates. Starting with various combinations of such axioms and postulates, the logician creates theorems by pure deduction from the axioms and postulates. As such initial theorems are presumed to be proven in this way, they are used as if they were axioms, too; a new layer of theorems is constructed so. So it goes, on and on, more or less indefinitely.

All possible theorems which might be constructed so, from the starting-point of some fixed set of axioms and postulates, is termed a "theorem-lattice." It is the required property of such a lattice, than each and every theorem is deductively consistent with the original set of axioms and postulates. In other words, no theorem contains any idea which was not already implied when the original set of axioms and postulates was adopted arbitrarily. This property of deductive lattices is sometimes called "the hereditary principle," signifying that the theorems of a lattice are each and all "genetically" determined by the adoption of an original set of arbitrary axioms and postulates.

A mathematical physics constructed in the form of such a lattice, is collapsed from top to bottom by experimental proof of just a single fundamental scientific discovery. The leading nineteenth-century physicist, Prof. Bernhard Riemann, defined such experiments as "unique experiments"; in modern university laboratories, the term "crucial experiment" is preferred usage. In the case of what Riemann defines as a "unique experiment," the experimental proof against just one single theorem of a mathematical-physics theorem-latticework, collapses each and every other theorem of that same lattice, to the effect that that entire deductive system must be torn down and built up again in a new way.

The source of the flaw in intellectual development which has led to the spread of irrationalism: philosopher Immanuel Kant (1724-1804).

The logical formalist demands that every theorem of mathematical physics be consistent with every other theorem in mathematical physics, otherwise we must forbid the physics professor to write mathematical deductive proofs of any among his propositions. This means that every mathematical formula used as a recipe in such physics, must be not only deductively consistent with every other such formula, but each and all are consistent with some underlying set of axioms and postulates in a hereditary way. So, either every theorem which deductive method proves to belong to a lattice is true experimentally, or the entire lattice must collapse.

True, or wrongly supposed experimental facts, if they appear to disprove some theorem of rational science, may open the door to irrationalism by so discrediting a formal theorem-lattice. The result might be joining weird cults of the sort referenced in the *Times'* Bordewich piece on Colorado kookery. Ladies, whenever you hear the magical utterance, "Science could never explain this," grab tightly your purses! Kookery is afoot.

Look more closely at the effect of a unique experiment.

A unique experiment is constructed in the following way. The experimenter believes that some or all of the set of

axioms and postulates of an established theorem-lattice are in error. To prove this in an experimental way, the following must be done. The experimenter must state what is termed an "antinomy," two opposing theorems each predicting some respectively contradictory experimental effect. The first of the two theorems will be one which is rigorously consistent with the theorem-lattice to be disproven; the second will be consistent with a different set of axioms and postulates than the first. If the experimental results show rigorously that the first theorem is wrong, and the second correct, the entire lattice to which the first belongs is disproven by even a single such experiment.

Let us use that standpoint to show how Kant's way of thinking leads to the sort of wildly irrational mysticism of which the great poet Heinrich Heine warned in his own famous *Religion and Philosophy in Germany*.

Let us call the theorem-lattice disproven experimentally Lattice A. The experiment obliges the formalist to discard every theorem in Lattice A in the following way. The formalist must first identify which among the set of axioms and postulates of Lattice A is at fault in the failure of the refuted theorem. On that basis, the formalist must adopt a new axiomatic basis, consistent with the alternate, experimentally proven theorem. From this starting-point of a new axiomatic basis, he must next reconstruct each and every theorem in Lattice A. The result of this reconstruction is a new theorem-lattice, which we shall reference now as Lattice B.

Any scientific discovery which demands such changes in mathematical physics, is what is meant by a valid fundamental discovery in physical science. Each and every valid fundamental discovery in physical science has that effect.

From the standpoint of what modern logicians term "the hereditary principle," no theorem in Lattice A is consistent with any theorem in Lattice B, and none in B consistent with any in A. Looking at this result of the reconstruction, Immanuel Kant would say that something, the newly discovered axiomatic assumptions responsible for Lattice B, has been created. Kant would insist, however, that the human mind could never account for the process by which the inventor developed the experimental hypothesis leading to proof of the discovery of Lattice B.

It is as though Lattice A and B were two opposite banks of a river, such that one could never walk across the river from one side to the other. It is as though there were an unbridgeable gap between the two lattices. Rather than "gap," let us use the term "mathematical discontinuity."

A well-trained mathematician, even of the sort who would defend the gist of Kant's argument, would agree that there are some things which can be said about this gap, this discontinuity. That mathematician would agree to say, that every smallest degree of change in the set of axioms and postulates of B, shall be defined as one degree of freedom. He would agree, that the smallest gap of absolute inconsistency between any Lattice A and any so-related Lattice B, is a gap generated by one degree of freedom of change in the axiomatic basis of Lattice A.

This is a very important principle in mathematical physics. Whenever we are confronted with an experimental process containing apparent mathematical discontinuities, the first step is to determine how many such degrees of freedom are represented by the gap associated with the discontinuity. This involves one of the strongest theorems in the branch of mathematics called topology, "Dirichlet's Principle."

Let us assume the case in which the gap between Lattice A and B is generated by one such degree of freedom; this presents Kant's defense of irrationalism in its purest form. In this case, there is no way in which the mathematical formalist can say anything about the gap, but to observe that it exists; it is impossible for him to reduce any gap of one degree of freedom to constituent parts.

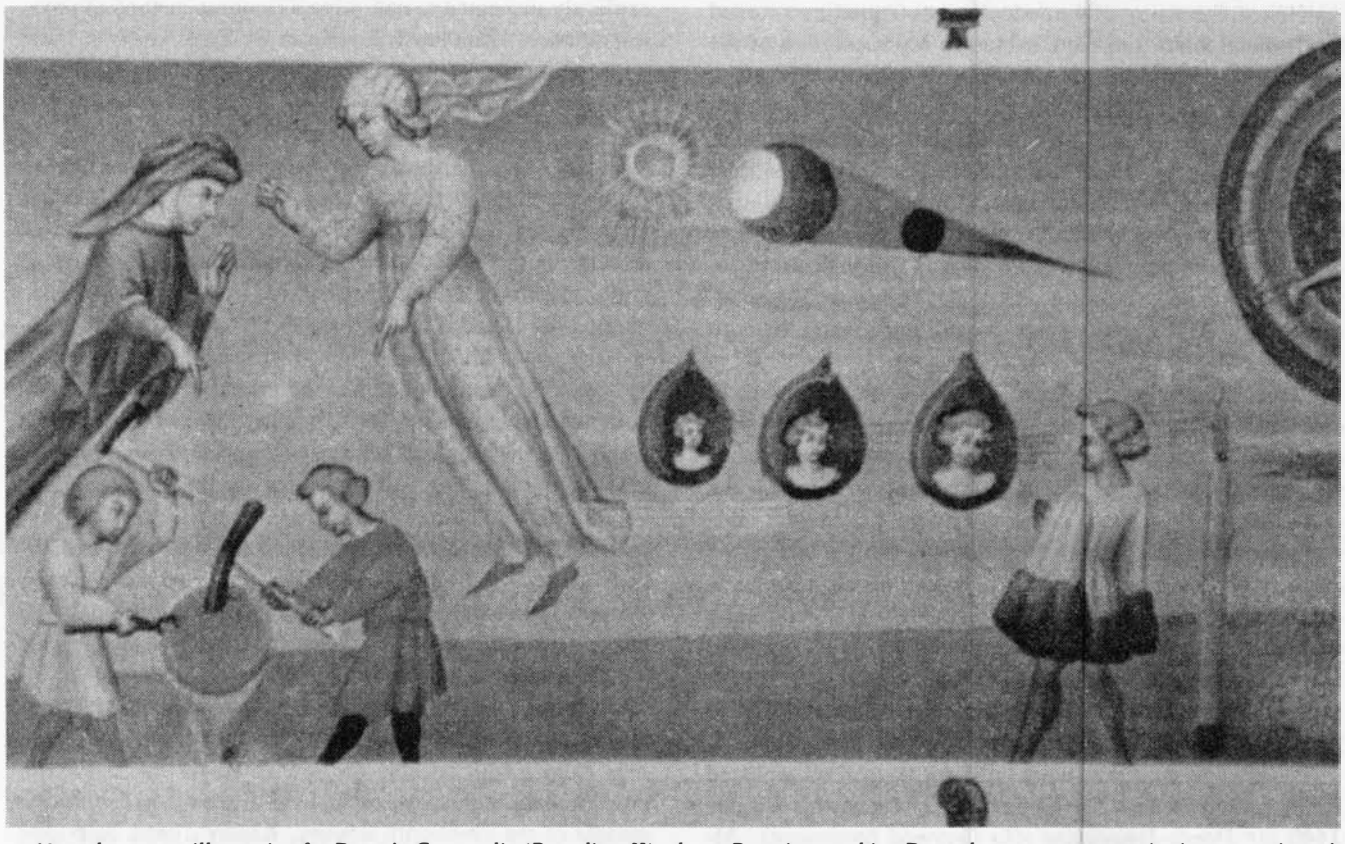
This gap is the result of the synthesis, of a change by one degree of freedom, generated in the mental processes of the discoverer posing the unique experiment responsible for the chain of events leading to the construction of Lattice B. Kant insists, that although the change has been created, it is impossible to discover an intelligible representation of the process by which the unique feature of the relevant experimental hypothesis was generated. For Kant, the mental-creative processes are hopelessly mysterious ones: He abandons the mental-creative processes to irrationalist's mystical speculations.

This proposition, central to Kant's *Critiques*, is the form in which irrationalist mysticism takes over the minds of persons who are otherwise proudly rational in the sense "rational" is associated with formal deductive logic.

Look at the verb "to create." This term is used in two ways. Here so far, we have examined the verb "to create" as the term might be used to identify the special quality of mental processes leading to a valid fundamental discovery in physical science. The term is also used to signify natural creation, such as the "creation of the universe." It is impossible to name an object in the physical world, unless there exists a corresponding object within the imagination. We identify objects in the real world, by means of corresponding objects in the imagination. Unless we can portray a process occurring within the mind which corresponds to a process of creation in the real world, our use of the verb "to create" is without meaning. Kant agrees, and means just that in his treatment of "synthetic judgment *a priori*" in his *Critiques*.

This is the key to the kind of cult mysticism we are examining here. All cult mysticism assumes the existence of certain unknowable processes in the human mind, which are able to control unknowable, but powerful processes in creation outside the mind. This problem of mystical irrationalism is what Socrates demands we escape when he says, "Know thyself." That is the only meaning of that "Know thyself" consistent with the entirety of the Platonic dialogues.

The characteristic of this thesis of Kant's figure is, as we have already indicated, that he was, like Voltaire, among the



A fifteenth-century illustration for Dante's Commedia (Paradise, II), shows Beatrice teaching Dante how to carry out a 'unique experiment' to test his hypotheses about the cause of spots on the moon. The two-phase experiment, shown at the right, involves observing an eclipse (above) and reflections in mirrors placed at varying intervals (below).

most fanatical of the enemies of Gottfried Leibniz's work. Like Voltaire, Kant's enmity against Leibniz's *Monadology* was fierce, but the center of his hatred was Leibniz's devastating proof that Descartes' view of the physical universe was dangerously absurd. When Kant allied with the British empiricists, especially David Hume, it was in the effort to discredit Leibniz, and to defend Descartes. The central feature of Kant's Cartesian attack on Leibniz is insisting that the human mind is incapable of intelligible representation of a creative process.

In the work of Descartes himself, the central feature is Descartes' argument for the *deus ex machina*. In all essential features, Descartes' argument is identical to that we have just portrayed as Kant's. Descartes, like Kant later, insisted, on the one hand, that creation existed, but that it was impossible to construct an intelligible, rational representation of any process corresponding to the verb "to create." So, all that Descartes placed outside the range of his formal-deductive system of rational analysis, he, like Kant, abandoned to the domain of mystical irrationalism.

To the degree that modern persons accept the same, foolish assumption, that "rationality" equals formal-deductive logic, there lurks behind that logical exterior the potential to become a fanatical adherent of some weirdly mystical cult.

Something efficient does exist beyond the scope of formal-deductive logic. Yet, contrary to the delusions of the modern mystics, what exists beyond such logic is fully susceptible of intelligible, rational representation. The apparent gaps, the discontinuities between Lattices A and B, are susceptible of rational forms of intelligible representation. This was known long before Kant was born.

Two factions in modern science

Since approximately the beginning of the seventeenth century, physical science in Western Europe—and, the Americas—has been divided into two factions. Modern science was established, beginning the fifteenth century, by what are conveniently named "the constructivists," as typified by Nicolaus of Cusa, Luca Pacioli, Leonardo da Vinci, later, Johannes Kepler, Blaise Pascal, Leibniz, and, in the nineteenth century, by such figures as Karl Gauss and Bernhard Riemann. Near the close of the sixteenth century, a powerfully backed reaction against "constructivism" was launched; out of this, Descartes emerged as the leading representative of the strictly formal-deductive method modeled upon Euclid's *Elements*.

Hence, the claims of the deductionists (sometimes named the "reductionists") to have exclusive representation of the methods of scientific work and rationality, is the extravagant sort of claim advanced by one of the two factions of science, refusing to acknowledge even the existence of the other leading faction. As the case of radical deductionist Bertrand Russell illustrates the point, the wild claims of the reductionists have a great deal to do with the intentional spread of the sort of "New Age" kookery now spreading in Colorado and elsewhere. Some knowledge of this controversy, as it bears directly on Kant's argument, helps us to understand the connections.

Modern Western European science is an outgrowth of discoveries elaborated during the fifteenth century by Cardinal Nicolaus of Cusa. Cusa, like the earlier Thomas à Kempis, and the later Erasmus of Rotterdam, was among the splendid young geniuses turned out by the program of classical education organized by a great teaching order, the Brothers of the Common Life. Cusa's accomplishments, from the age of 30, while he was playing a key role in rebuilding the shattered Papacy, until his final years as a leading Cardinal, are more or less universal in scope, covering theology, statecraft generally, strategic diplomacy in particular, and the establishment of the method of the physical sciences.

Cusa's first published work on scientific method appeared in the setting of the 1439 Council of Florence, his famous 1440 *De Docta Ignorantia* (*On Learned Ignorance*). Although the work gives the first impression of being purely and simply a theological treatise referencing the relevant implications of the famous "Parmenides Paradox," Cusa's method of argument is explicitly geometrical, rather than deductive. The geometrical features include presentation of a principle known to later generations of mathematical physicists under such various rubrics as "the isoperimetric theorem" of topology, and the principle of "least action" in physics. These features of *De Docta Ignorantia* are a leading point of origin of the "constructivist" faction in modern science.

From the manuscripts of Cusa's sermons, we are informed how the discovery of the isoperimetric definition of a universal principle of physical least action came to be discovered. Among the classical Greek manuscripts delivered to Florence by the George Gemisthos known as "Plethon," were the dialogues of Plato and writings of Archimedes. Cusa worked in the manner of attention to primary sources emphasized by the Brothers of the Common Life's educational program for producing geniuses. In his sermons, we learn that his discovery of the isoperimetric principle came about through reworking Archimedes' theorems on the problem of attempting the quadrature of the circle. Cusa reports there, that he had discovered a much better picture of this problem than that provided by Archimedes; that solution is known today as the isoperimetric theorem as featured early in *De Docta Ignorantia*.

In later years, Cusa produced a series of published works explicitly dedicated to definiting a rigorous method of physical science. How much Leonardo da Vinci knew of these writings before arriving in Milan, we do not know; at Milan, he entered into collaboration with a Fra Luca Pacioli (*De Divina Proportione*) who based his own work directly on Cusa's writings. The work of Pacioli, Leonardo, and their collaborators, in physical science, painting, and architecture, including the work of the later School of Raphael, was based directly on the fruits of the Pacioli-Leonardo collaboration within the frame of reference defined by Cusa's writings on methods of physical science.

The most famous early outgrowth of this development of the constructivist faction, was the establishment of the first comprehensive form of mathematical physics by Johannes Kepler. In the prefaced acknowledgements of his *The Harmony of the World,* Kepler indicates his direct debt to Cusa, Pacioli, and Leonardo. It was Cusa's case for the solar hypothesis (not the legendary influence of Copernicus and Tycho Brahe) which directed Kepler's approach to the solar system. It was the work of Pacioli and his collaborators on the implications of the five Platonic solids, which guided Kepler throughout the entirety of his published work.

Although the collaborators Christian Huyghens and Liebniz adopt verbatim formulations from Leonardo's writings, it is Kepler who became the watershed for the successful development of mathematical physics through to beyond the middle of the nineteenth century. Kepler's work embodies the fundamental discoveries contributed by his scientific predecessors, and echoes the notions of electromagnetism contributed by his contemporary, William Gilbert (*De Magnete*).

Cusa's work clarifies the fact, that if we attempt to base physics upon consistency with two faulty assumptions of deductive geometry, crucial problems appear as unintelligible mysteries. Such problems are typified by the impossibility of squaring the circle or trisecting angles; they include the problem of showing why only five regular polyhedra can be constructed. The faulty assumptions center around two axioms, both shown in physics to be false to reality. The first such fallacy, is the axiomatic definition of the self-evident existence of infinitely small points; the second is the assumption that the pathway of least action in empty space and empty time is straight-line movement. These two arbitrary and fallacious axioms, are the hereditary source of incompetencies pervading the physics of Descartes and Newton.

Employ a different definition of a circle than that supplied by deductive geometric formalism. Let us say that a circle is the smallest perimeter enclosing the relatively largest area. Better, let us say that the circular form of perimetric action is the least action required to generate the relatively largest amount of work. In that case, circular action acting upon circular action at every smallest interval of circular action, generates a sphere. The same method constructs the existence of a line we may call "straight," and also shows how circular

action constructs the existence of points. Neither straight lines nor points exist self-evidently; both come into existence through construction.

Starting from the derivation of the straight lines and points in this way, we generate every valid theorem in Euclidean plane and solid geometry by nothing but construction, not permitting a single axiom or postulate, nor any effort to introduce deductive forms of argument. This approach to geometry is often called "constructive" or "synthetic geometry"

Another name for a constructive geometry based upon the isoperimetric definition of physical least action, is a "non-Euclidean geometry." The strict meaning of "non-Euclidean," is a constructive geometry from which deductive method is prohibited, in which no sets of axioms and postulates analogous to those of Euclidean geometry are allowed. Unfortunately, the term "non-Euclidean" has been often misused in modern textbooks and elsewhere, to signify merely a modification of one or more of the postulates of a deductive Euclidean geometry, while preserving such axiomatic fallacies as the arbitrary definition of the point. Despite the popularity of such latter misuses, the definition of "non-Euclidean" supplied here is the only correct one.

Although classical Greek geometry of the time of Pericles and Plato is proven to have been a constructive geometry, unlike that later, Ptolemaic concoction of Euclid's *Elements*, for all practical purposes modern non-Euclidean geometry was established by the combined work of Cusa, Pacioli, Leonardo, and Kepler. The mathematical physics of Gauss, Riemann, and their collaborators is a continuation of the kind of non-Euclidean geometry of Cusa et al.

The emergence of constructive geometry, is rooted in a specific philosophical outlook on physical science as a whole, not limited to the mathematical aspect. From Cusa through Riemann's work on the representation of an arbitrary function, and among those of us who share this view today, the central principle of scientific work is, that nothing as arbitrary as the asserted self-evidence of axioms is to be tolerated. Anything which exists is susceptible of a rational form of intelligible representation within the limits of a perfected sort of (nonlinear) mathematical physics of the transfinite.

It was this attitude, in and of itself, which has led to the greatest fundamental accomplishments in scientific discovery. If we can not supply an intelligible representation of something shown experimentally to exist, this can be only for one of two reasons. Either the process under consideration might be mastered from the standpoint of existing science, but we have failed to master that science adequately; or, in the kind of case we stress here, the existing scientific knowledge contains some axiomatic quality of defect which prevents any understanding of the nature of the process under consideration.

Today, in presenting the usefulness of science to a popular audience, there is a temptation to suggest that so-and-so made such-and-such a discovery to enable mankind to enjoy some practical benefit. True, often a scientist brought an important discovery to completion because of the perceived urgency of overcoming some practical problem. Despite such examples, if we examine the history of science and of leading scientific discoverers from the inside, the popularized stories about the scientist's practical motivations are shown to be largely false.

True, governments and other wealthy funders of scientific projects, usually do so because they are convinced that the work is of practical importance in the here and now. Many major breakthroughs in technology, as the Manhattan Project illustrates the point, were brought to completion because of the practical motivations of the project's sponsors. That granted, to see only this side of the matter is a great error.

Usually, the final phase of developing science for some immediately practical purpose comes long after "pure science," so-called, has already discovered the principles involved. The scientist's discoveries in matters of principle begin with the development of the individual's proto-scientific potentialities during childhood and adolescence. Often, the scientist who achieves fame for some accomplishment during his thirties or forties, or even later in his or her life, had already begun to work in that direction before completing a university education. It is among such earlier years that we must seek the more fundamental motivations of the later accomplishments.

It begins in early childhood, expressed in such forms as a child's engagement in constructive block-building play. The child who never, or very rarely knocks over the blocks in enraged frustration, is more likely to develop as a scientist. The child who is engaged in periods of concentration for much longer than average, in discovering what are for that child new principles of possible constructions, is already developing a potential for later scientific work. Usually, it is in the play of children that the hints of the future scientific personality may be observed, long before so-called practical end-results for society in general come into consideration. A child's curiosity, to discover "Why?" is the root of the matter; sustained, compelling, and omnipresent curiosity to discover "Why?" is the germ of the world-outlook of the scientist of, most emphatically, the constructivist faction.

A related problem is posed in the degeneration of education in the United States during the recent 25 years. Not only are the potentialities of the student's character and problem-solving capabilities not fostered, even to the degree they used to be as recently as the 1950s. The substitution of "true/false" and "multiple-choice" testing methods for essay forms, coincides with a degeneration of education, to the effect that the product of those institutions identifies as knowledge "what I have been taught," rather than "what I have become able to demonstrate to you by constructing it before your eyes here and now."

We were already descending in this general direction

when widespread use of the textbook replaced humanist education's emphasis upon the student's working through relevant primary classical and analogous sources. Unlike the Brothers of the Common Life's exemplary dedication to a humanist form of secondary education intended to foster original thinkers, U.S. education has degenerated into the teaching of moderation and mediocrity. Education has forgotten how young geniuses are produced; the popularized, fundamental misunderstanding of scientific work echoes that progress of mediocritization.

The deeper motivation of the scientific discoverer, is of the form of hearing himself think, "I do not understand why this is so." When a young future scientist has reached the point that he or she realizes that something taught as established truth is based on some fallacious assumption, the impulse to repair the body of science on this account is strong. If further consideration of the problem persuades the young mind that this is an important flaw in accepted scientific opinion, or simply an unexplored region which the integrity of science demands be resolved, we have there and then, in germ, the quality of life's-work dedication shaping the future scientific discoverer.

That same drive to render all that is real susceptible of rational forms of intelligible representation, is the essence of the scientific conscience, the constant goad which impels one to improve science, needing no motive but this simple one. As we see in Karl Gauss's expressed contempt for Immanuel Kant, whenever a true scientific mind is presented with the theses on "the unknowable" featured in Kant's *Critique of Judgment,* the scientist's instinctive reaction is: Kantianism must be destroyed.

The author's own scientific contributions, in the field of the science of physical economy, also illustrate that fact. The work was begun for what was ostensibly no practical purpose but to expose as fraudulent a scientifically absurd and also immoral feature of the "information theory" dogma of Prof. Norbert Wiener. Although the immediate issue was Wiener's dehumanizing creative-mental processes to a mere Boltzmannian statistical aberration, the author recognized Wiener's and John v. Neumann's absurd views on the human mind to be a reflection of the fallacies of Kant's *Critiques*.

The case of Leibniz's resolution to destroy the reputation of René Descartes, following his own meeting with Spinoza, is an example of the same motivation. To render creation rationally intelligible to the human mind, is the root-emotion which moves the scientist toward fundamental discoveries. Cusa's emphasis on the possibility of rational forms of intelligible representation of the real universe, is the spark of genius responsible for all of the principal achievements of modern European science.

At this point, the report continues briefly the autobiographical point. On background: The possibility of supplying such an intelligible representation of the discontinuity between Lattice A and Lattice B did not appear within mathematical physics until the 1850s, through successive discoveries by Gauss, Lejeune Dirichlet, and Bernhard Riemann. This began with Gauss's reworking of Kepler's astrophysics, leading into Gauss's fundamental discoveries respecting the intelligibility of the ordering of elliptic functions.

Gauss began, naturally, with the form of synthetic geometry existing up to that time: the synthetic geometry based upon isoperimetrically defined circular least action acting upon such circular action—called multiply-connected circular action. Gauss's breakthrough, beyond that earlier form of synthetic geometry, occurred in connection with his geometrical solution to the problem of constructing the arithmetic-geometric mean. With aid of the elaboration of elliptic functions from this vantage point, he showed that Kepler had been essentially correct, where Descartes and Newton had been axiomatically wrong. This laid the foundation for a fresh view of the lawful ordering of the universe.

The center of this Gaussian revolution in physics is the new way in which he defined physical least action. Instead of simply-circular least action, Gauss required the case that circular action, proceeding in time, may be increased or diminished at a constant rate while this process is extended. Instead of circular action, we have a self-similar spiral constructed on the surface of a cone. That discovery solves all of the mysteries of ordinary geometry; but, it posed immediately a crucial new problem.

In substituting multipy-connected self-similar spiral action for multiply-connected circular action, Gauss changed the representation of both geometry and the physical universe in an elementary way. Any construction based on continuing multiply-connected self-similar spiral action generates gaps within the mathematical representation of the process so described. The gaps have the form of mathematical discontinuities. When we find that there is a physical event precisely corresponding to such a mathematical discontinuity, we term that event a singularity. That sort of discontinuity is identical with the gap, or discontinuity, we have described as existing between Lattice A and Lattice B.

Since the processes described in this way are continuing processes in the real world, how might mathematics describe that continuity through and past the point a singularity occurs during the course of the process? The elementary features of this problem were solved by what Riemann referenced as "Dirichlet's Principle." Prof. Karl Weierstrass pursued a similar line of investigation; he referenced the fact that there are limits to the successful employment of Fourier Analysis. In some cases, the process being examined must exhibit mathematical discontinuities; Weierstrass provided a model, elementary example of the way such defiant cases could be generated in a rational form of intelligible representation.

Riemann combined these contributions of Dirichlet and Weierstrass, developing what is known as the Riemann surface function. A student of Weierstrass, Georg Cantor, employed the standpoint of both his former teacher and Riemann

to continue the attack on problems of Fourier Analysis. Cantor made some important contributions to the understanding of Riemannian complex functions. Most crucial was his representation of the fact that the number of discontinuities which occur within an arbitrarily small interval of a process are implicitly listable by means of proper examination of the mathematical function describing the processes in which these discontinuities occur.

This author's work of the 1948-52 interval started from the treatment of the Kantian paradox described earlier here. This led to the need to discover the means by which such lattice-gaps could be rendered intelligible discontinuities of some mathematical representation of a continuous process of creative-mental activity. This phase of inquiries took him first to Cantor; Cantor impelled correction of the author's earlier, misinformed views on Riemann.

The discoveries, originally developed in bare essentials during that period, were intended to supply a crucial refutation of Wiener's statistical information theory, by showing implications of the way in which creative scientific and related discoveries increase the potential productivity of manufacturing operatives. It was relatively simple for one steeped in the systematic refutation of Kant, to show that such a cause-and-effect connection existed. The greater difficulty was that of mastering the work of Riemann and Cantor to the purpose of identifying the mathematical approaches needed to transform this known causal relationship into a measurable one.

Once that process had been completed in preliminary, bare form, in 1952, then began the attention to the practical implications of this discovery respecting the applied science of physical economy. In the history of most of the cases of major and lesser discoveries in science which the author has surveyed, the pattern is much the same as in his own case.

This process began at about the age of 12 years, when, in the course of self-assignment to read the works of a series of leading philosophers, the author became a convert to Leibniz, and not much later began wrestling with Kant to the purpose of defending Leibniz. It was the passion for a certain quality of personal mental integrity respecting matters of knowledge, acquired during adolescence in this way, with the standpoint of Leibniz adopted, which shaped the author's character and related motivations, to respond to the shocking fallacies of Wiener and John v. Neumann as he did. The idea of a practical use for this work came only after the initial discovery had been worked through.

Göttingen photo by Uwe Parpart

Children in a Washington, D.C. junior high school are afforded a rare experience with constructive geometry. In general today, students are deprived of such grounding, and learn not how to discover, but to propitiate the textbook and teacher. Inset: Students' models from the classical period of German mathematics, on display at Göttingen University in West Germany.

Riemann's elaboration of his later leading achievements did not come suddenly. Riemann's thinking in this direction is clearly shown during the 1840s, in his posthumously published notes on a lecture-series delivered by the anti-Kantian synthetic geometer Herbart. His inaugural dissertation (published in 1854), "On the Hypotheses Which Underlie Geometry," contains the essential germ of thought expressed in the elaboration of the Riemann surface function. So does his dissertation on the representation of an arbitrary function, and his continuation of Dirichlet's work on density of prime numbers within a chosen interval. The essence of the matter, is that by the close of Riemann's life, the problem of a rational form of intelligible representation of a creative process was solved in principle.

This implication of Riemann's work, should impel us to look afresh at Plato's dialogues. Those dialogues, especially when taken as an entirety, are another way of representing a solution to the same problem. The essence of the Socratic method is examination of the successive layers of assumptions underlying any set of theorem-propositions. The dialogue is directed to uncovering underlying sets of assumptions which affect a person's judgment in such a way as to cause the set of axioms and postulates of a deductive lattice to define the characteristic "hereditary principle" of that lattice. Socrates changes assumptions shown to be absurd, thus defining a new way of looking at the subject of the propositions being examined.

In scientific creativity, it can be shown that there is a continuous pathway, corresponding to increase of the potential productive powers of mankind: a pathway which may be described in terms of successive transformations in the sets of axioms and postulates which deductive method might attribute to scientific knowledge. The internal history of science, especially inside the constructivist current, roughly corresponds to this. Any process which is continuous in that sense, and which develops in an ordered way, can be rendered intelligible in rational terms. Plato's dialogues supply us one view of this process; Riemann's method points to the means by which this can be supplied a mathematical representation.

The popularity of the deductive method today, and the shift in education, away from "I can construct," to "That which I have been taught," is in large part a reflection of a degeneration in educational policies.

In the best classical humanist education, the adolescent student was obliged to work through relevant primary sources respecting the most fundamental discoveries and related problem-solving accomplishments on which the highest degrees of progress of civilization up to then had been based. The student was so obliged to follow the thinking of great discoverers and creative artists of the past, to the effect that he was able to reconstruct that discovery by his own will.

As a consequence, the successful matriculant of such educational programs had achieved two things immediately. Obviously, he knew leading elements of the history of development of knowledge almost as if he had made these discoveries himself. On a deeper and broader level, he had assimilated the point of view and methodological habits of rigorous thinking during the crucial, formative years of his adolescent development of mature powers of mind.

Today, deprived of such grounding in secondary education, the student has learned not how to discover, but how to propitiate the textbook and professor. Since the student has not learned "I can construct," he does not really know what he has been taught, but merely how to behave in an accepted way, as "I have been taught." It is said that "consistency is the hobgoblin of small minds." So, being educated signifies more defending the social acceptability of one's assertions by aid of deductive sophistries, than concern for one's ability to reproduce by construction a proof of what is asserted.

This trend in both the inside of educational practices, and in public attitudes toward education and the educated, has fostered a potential catastrophe. Although we still value creative work, if only in a diminishing degree relative to 20-odd years ago and earlier, we hope that our society will produce the required quotient of those social eccentrics capable of supplying our society's scientific and other creative needs. However, we are unwilling to maintain the educational policies indispensable for developing the required ration of such creative personalities.

We have so established an absurd distinction between "fundamental" and "applied science." We put "fundamental research" into one compartment, a dwindling handful of seeming eccentrics. We put the expressions of "applied science" into another, much larger compartment. We have created so, even among those ostensibly commanding a formal scientific education, a situation in which the creative work of the gifted minority is beyond the efficient comprehension of the practitioner of so-called "applied science," and this is often so even when the latter has gained a terminal academic degree in the relevant specialty.

These altered sets of social values, bearing upon the professions and educational policies, have fostered more broadly a population losing the capacity for efficient assimilation of scientific and technological progress.

So, consistency among that which is merely taught as textbook or kindred form of "knowledge," has been established as the hallmark of the professional. Thus, those whose education is based upon a propitiatory attitude toward what "I was taught," fall into two classes. There are the serious practitioners, who have a horror of participating in fakery, but are delimited in scientific capabilities by the deductive world-outlook on their profession. More and more, the educated fall into a second class, those, like Carl Sagan, for example, who cheat in arguing their points by resort to deductive sophistries, even in defense of deliberate hoaxes.

As to which view of science might be the correct one, the sophisticated subscriber to publications, depends upon the

second-hand opinion of such referees as the editorial policy-shapers of the popular science journals, or even the so-often scientifically self-discredited *New York Times*.

The included broad social effect of this trend toward intellectual mediocrity, is the personality generally viewed as informed and rational, who has actually not the slightest idea of how valid scientific discoveries are produced, or of how to distinguish what appears to be a logically consistent argument from supposed fact, from a rigorous search for truth. The victim of this sort of social conditioning is typified by the person who, on the one side, appears to conduct his daily employment and some other duties in a more or less rational mode, but who is also susceptible under stress to the wildest kookeries.

Whatever faction seizes day-by-day control of the training and qualifications of teachers in primary and secondary schools, and which is able to shape the curricula of those schools, both as to definition and objectives of taught topics, and methods of pedagogy employed, has the greatest power to subvert, and destroy the moral fabric of whole generations coming toward maturity, and thus to destroy our nation.

That sort of destruction is very advanced. It began with Fabian subversives of the like of John Dewey. In the march of the radicals of 1968 through the institutions, more and more teachers and schools infected with the counterculture today, have become in effect the Devil's own shock-troops out of Hell; these "Rumpelstiltskins" of the educational systems' radical mafia have become an "Invasion of the Body Snatchers," seizing and destroying our children and youth, so that our nation, too, might be destroyed largely from within.

Sane and lunatic metaphysics

The sane use of the term "metaphysics" signifies those aspects of the real universe which can not be represented rationally in a deductive mode. From the standpoint of modern physics, we can say the same thing in a different way.

In the street-language of the physics profession, processes which are continuous despite the occurrence of singularities in midstream, are termed "nonlinear." This signifies that such processes can not be supplied a rational form of intelligible representation within the limits of a deductive form of mathematics. All deductive systems are inherently linear ones; so, it is useful emphasis to reference really existing metaphysical occurrences as belonging to the rational category of "nonlinear" phenomena.

Yet, there is a different view of the term "metaphysical." Francis Bacon and other adversaries denounced the work of Cusa, Pacioli, Leonardo, and Kepler, as "metaphysical." This is a curious indictment, coming from the mouth of a science-illiterate, Bacon, whose chosen immediate adversary was a person perhaps the most accomplished scientist England ever produced, Gilbert. What these critics of Kepler, Gilbert, et al. were stressing, is that Kepler's physics is not based upon a Euclidean deductive geometry: Anything not falling within the bounds of such deductive systems, they feel free to class as metaphysical in whatever way they may wish.

Bacon and the circles of Isaac Newton were wild kooks in their own right. Bacon's circles, including his famous secretary, and reputed male mistress, Thomas Hobbes, brought the cult of Rosicruceanism into the court circles of the Stuarts, and adherents of that cult into dominant roles in the London Royal Society of Newton, Boyle, et al. Cabalist kookery was so widespread among Bacon's circles, since not later than Cambridge and Oxford Universities at the close of the sixteenth century, that the wags of the Stuart Restoration period referred to the members of one royal cabinet as "the cabal." When Newton's famous chest of laboratory papers was opened during this century, the contents showed his principal scientific preoccupation to have been attempts at black magic.

This pathological mysticism of the seventeenth-century circles lead directly into the satan-worshipping Hell Fire cults of eighteenth-century Hanoverian British liberal aristocracy. That eighteenth-century obscenity led directly into the nineteenth-century theosophical cults centered around Oxford University's John Ruskin, and later Blavatsky, Annie Besant, and satanists Aleister Crowley, Aldous Huxley, and Gregory Bateson: the chief origins of the lurid kookery running amok in Bordewich's report on Colorado today.

What Bacon and his faction described as Kepler's metaphysics, is based upon the principle of physical least action. The leading feature of this is the work of Leonardo and Pacioli on the implications of the five Platonic solids. By examining the case of the Platonic solids, harmonic orderings congruent with the circle's Golden Section are shown to represent a limit of construction in visible space. Kepler posed the hypothesis, that the shaping of physical space-time is bounded by this implication of the Golden Section.

Kepler was right on this point, at least as far as he asserted any claims for his theorems. Granted, his was a somewhat crude approximation of the actual curvature of physical space-time, but it was in the right direction conceptually, and as good an approximation as was possible with the evidence possessed by Europe at that time. What was chiefly lacking, was proof of the reason why the Golden Section should have the peculiar importance it does. No satisfactory answer to this could have been provided until after the indicated work of Gauss et al., approximately two centuries later.

The work of Gauss and his collaborators showed that the curvature of physical space-time can be understood only in terms of nonlinear processes. Hence, Kepler's work was rooted in the metaphysical, or, as science defines it today, the transfinite. For Baconians or others to say it was not science, because it used such metaphysics, is absurd.

The error of Kepler's critics, past and present, is essentially as follows.

In the mechanistic, deductive view of the universe, such as that of Euclid's *Elements*, space and time are "empty" but for discrete bodies roaming about within. Physical action is assumed to occur along infinitely extended straight lines in space and time, and the principles of physical action are assumed to be discovered in examination of interactions among discrete, more or less solid little bodies, studied in terms of one pair of such bodies considered at a time. This results in a "linear," mechanistic form of deductive mathematical physics.

With Kepler and the relativists, the opposite view is adopted. Kepler starts with the universe as a whole, which he defines as being represented by the characteristic space-time curvature. He derives each and all of his physical laws directly from that curvature. The empirical proof of his work is the correspondence of the observed evidence to lawful behavior calculated from the standpoint of only the curvature of physical space-time as a whole.

One proof of Kepler's method is perhaps the most startling to the layman or to the typically miseducated science graduate of today.

On this basis, Kepler calculated the harmonic orbital values of a planet lying between the orbits of Mars and Jupiter, an orbit lying between the arithmetic and geometric mean for the octave within which Mars and Jupiter lie. Kepler specified that the curvature of physical space-time demanded this planet must have existed, but that the harmonic characteristics of its orbit ensured its eventual destruction.

The existence of the asteroid belt was unknown until the end of the eighteenth century, but, as Gauss demonstrated for the cases of Ceres and Pallas, Kepler had correctly estimated the orbital harmonics of the asteroid belt. That was crucial empirical proof that such opponents of Kepler as Descartes and Newton were using an absurd physics; it also underlined the efficiency of deriving the laws of the universe from nothing but the physical space-time curvature of that universe.

To restate what has just been summarized. For Bacon, Descartes, and Newton, what Kepler accomplished was "metaphysics," because it was purely metaphysical reasoning from their own point of view. Kepler's laws of physics belong to a nonlinear universe. For such as Descartes and Newton, and Kant later, the physical universe was limited, by definition, to models which could be represented by a linear form of deductive mathematical arguments; for them, anything outside the scope of what is known today as eighteenth-century "Enlightenment materialism," is seen as "bad metaphysics."

For Kant, anything which is classed as "metaphysical" is unknowable. So, in such matters, Kant authorized arbitrary opinion to do whatever it pleased. This was summed up most explicitly, most flagrantly, in his *Critique of Judgment*. In that *Critique* there is contained implicitly the proto-Nazi irrationalism of the later Prof. Karl Savigny, and Karl Marx's derivation of his "historical materialism" directly from the irrationalist *Volksgeist* dogma of Savigny.

Savigny, who is the author of the Romantic dogmas of law in statecraft and the fine arts generally, became influential outside continental Europe as supplying a rationale for what is otherwise viewed as British philosophical liberalism. In law, Savigny is the leading exponent of the demand that truth and natural law be expelled from legal proceedings. He is otherwise a forerunner of the Nazis and today's radical liberals, in the doctrine of "All is permitted." For him, and like-minded circles, there is no truth, no natural law, no morality, but merely the caprices of perceived contemporary trends in arbitrary opinion.

Thus, Kant's critically influential role in outlawing reason from the domain of metaphysics, could not have been more maliciously wicked than if the argument had been concocted by the Devil himself.

Earlier, among Church Fathers, the term metaphysics had a meaning which is not the pejorative one associated with the popular use of the term "metaphysical" today. It meant, essentially, that which really existed, but which could not be given an intelligible representation within the scope of deductive reasoning from commonplace sense-perceptions. If we equate "metaphysical" with the transfinite realm of nonlinear processes, the Church Fathers were on solid scientific ground.

Today, a very large portion of what was formerly classed under the heading of metaphysics is a solidly established aspect of mathematical physics, especially the nonlinear aspect. Some have insisted that this has the effect of driving God into a much-reduced part of the universe as a whole. Hearing such observations, the Christian theologist shakes his head with a reproving smile, warning that revealed mysteries merely bring God's efficient rule in the universe less imperfectly into view. What such progress of science into nonlinear realms accomplishes, is to leave less room for the kinds of arbitrary, satanic superstition stalking the Colorado landscape today.

Of course, the flawed logical mind sees this matter differently than do we. To him, whatever he imagines science can not explain, is license for him to accept on faith almost any exotic superstition with curious attractions. This is expressed by the professedly agnostic sort of fan of horoscopes. He says, with the customary wink, "I am not certain it works, but you have to admit that there just might be something to it." A "lucky" rabbit's foot—which had brought small luck to the rabbit—may be adopted in a similar way. All gamblers suffer a kindred form of pagan superstition.

Our critic's irrationalist streak shows in other ways. For example, there is the superstition that persons with eyes too close set, or ears or neck of not the desired proportions, are not to be trusted. The sundry, popularized "old wives' tales" which pass for "folk wisdom" in some strata, are another form of superstition. All of these are forms of pagan belief in

magic.

There are two customary sales pitches for pagan-style cult-superstitions. The more common is allusion to "rediscovering the mysterious powers of the ancients"; rarer, is unctuous reference to some sort of link with invisible flying saucers from a distant galaxy visiting our solar system.

"The mysterious power of ancient civilizations?" I have stood in the sands of the Mesopotamian desert, a tribute to the miraculous powers of the ancient, fallen empires of that region. Excepting the Celtic-Druidic cults exploited by Moscow as intelligence assets in the West, what became of the power of the Druids' culture? One finds a dirty, illiterate medicine-man of the tribe squatting in a foul hovel; what potency do such awesome wonders suggest? Think of the poor souls prating of "mysterious powers of the ancients," and ask ourselves, "What will such wisdom of the ancients do for them?"

The key to the spread of popularized pagan superstition, from astrology and gambling, through the exotic varieties on the Rocky Mountain landscape, is what was celebrated by dramatists Marlowe and Goethe as "the Faustian pact with Satan."

What do these poor fools expect, really? Empires? Mostly, they are poor little souls, whose comprehension of reality is pitiably constricted. They sell their souls for the price of very little things. As did the usual suckers at an old-fashioned medicine show, they seek mysterious ways of conquering their real or imagined diseases, defeating the aging process miraculously, realization of sexual fantasies, job security, money, luck generally, and some secret power simply to manipulate persons around them, or perhaps even to kill someone by means of a mysterious agency. This pathetic sort of buffoonery has not changed much since Christopher Marlowe's *Dr. Faustus*.

Paul Venaud

Satanic inscriptions on a highway support pillar near Cottonwood, California. Notice in the photo, on the same pillar, the names of the satanic rock bands Led Zeppelin and Motley Crüe.

Does some foul creature from the pictures in some book on symbolic philosophy, such as Abraxis, pop up in the middle of a pentagram, to prompt poor Fausts to sign a contract in blood on some smoldering parchment? Does the woman taking up the profession of witchcraft in Salem, Massachusetts actually perform a sexual act with some infernal goat-god on nearby Gallows' Hill? The most likely sort of "Rosemary's Baby" anyone will ever see is of the genre of a Charles Manson, or the drug- and disease-riddled body of some hard-rock group's star writhing on stage as if it needed desperately to be excused for a visit to the nearest toilet.

There is no contract with a sulfurous Mephistopheles, but they lose their souls nonetheless. They lose their sanity, their morals, inch by inch, as they are drawn deeper, into a more exotic depravity, inch by inch, again and again. In large numbers, they are a danger not only to themselves and their families, but, like the roving bands of such poor lunatics during the fourteenth-century's New Dark Age, they become capable of atrocities on a scale which threatens the social fabric of the nation.

So much for the purposes for which such poor folk enter a cult. How do they imagine the magic to operate to produce the desired benefits?

The central mechanism controlling the adherent to such cults is the belief that, by aid of methods of concentration copied from the pagan hesychasts (belly-button worshippers), they can call forth from within themselves some mysterious power, like that attributed to a witch, a magician. By aid of the abacadabra of black magic, and perhaps a human sacrifice here and there, they believe that the individual, or perhaps a group of individuals holding hands, might summon a spiritual potency to serve them as the genie of Aladdin's lamp.

Essentially, faith in magic centers in belief in some secret powers to be unleashed from within the mind. This is very deranged metaphysics.

In reality, the human mind does have metaphysical powers in the sense we have equated "metaphysical" to "nonlinear" and "transfinite" processes in the real universe. The classes of effects worth considering are chiefly three.

First, matters touching the subject of "extra-sensory perception." No scientist who knows the relevant fields of inquiry today would say that the electromagnetic broadcasts of the human brain might not be used to gain access into knowledge of processes going on within the mind, or that these weak radiations might not produce some detectable effects

on the environment. As much as we know bearing upon such matters today, there is nothing that we do know which is not classified under the heading of "very nonlinear"—in other words, "very Riemannian."

Second, the power of the mind to manipulate physical states of tissues of the body. With the development of the new branch of biophysics called "nonlinear spectroscopy," we are beginning to scratch the outer surface of such possibilities in biological knowledge.

Third, however, the essential "secret power" of the human mind is entirely that which sets man above the beasts: the power of the developed individual creative-mental processes to develop, and to assimilate efficiently valid fundamental discoveries in physical science. We know four most crucial facts which bear upon this third capability.

First, we know that the curvature of universal physical space-time is the Kepler-Gauss-Riemann curvature. Second, we know that all living processes have the identical space-time curvature. Third, it has been demonstrated recently, that subatomic microphysical space has the same space-time curvature. Fourth, the author's work has led to establishing the fact that the creative-mental processes of the individual hu-

Note on so-called 'non-Euclidean' geometries

For the convenience of the fastidious critic, and also for the convenience of those who would rather not be bothered with such details, we have relegated a pertinent observation on the modern usage of "non-Euclidean" to this appended note.

The popularity of the topic, "non-Euclidean geometries," began with the eruption of the subject of Special Relativity at the turn into the present century. Several experimental developments erupting insistently, repeatedly during the last decades of the nineteenth century, coincided with the general physics and electrodynamics of Bernhard Riemann, but this sort of vindication appeared at a time that most of the scientific community's official institutions had firmly committed themselves to discrediting Riemann's work. So, when Special Relativity erupted, those institutions were faced with the problem of adapting to this without thereby reviving the influence of Riemann's method.

This paradoxical situation led to the popularization of the so-called "non-Euclidean geometries." So, Gauss was portrayed as but one among several mathematicians, including prominently Lobachevski and Bolyai, who each had, more or less simultaneously, discovered slightly differing versions of a "non-Euclidean geometry" earlier. Since some among these had been elaborated in terms of merely alterations of the postulates of Euclidean geometry, this fact was chosen as the basis for a sophistry, arguing that Riemannian geometry was merely a different version of such an, in fact, "neo-Euclidean geometry."

The legendary "simultaneity" of the discoveries of Gauss, Lobachevski, and Bolyai, was an arbitrary concoction. Examining the papers of Gauss, we find that his relevant seminal discoveries were established rigorously early during his adult career. Related points were stated at various times of writing of Gauss's posthumously published literary output, so that it was not difficult for the sophists to choose only those references which it pleased them to imagine showed approximate simultaneity with the referenced work of Lobachevski and Bolyai.

To the degree that the work of Bolyai and Lobachevski may be placed in the same generation's time-span as some of Gauss's developments, there is nothing mysterious about this. Prior to, and even briefly following the 1815 Treaty of Vienna, the French Ecole Polytechnique, sponsored by Lazare Carnot and led by Carnot's former teacher, Gaspard Monge, had been the world's center of advanced scientific thought. Monge's program in projective geometry, and applications of this form of constructive geometry to physics, had been the leading feature of the Ecole's greatest contributions, including the famous work of Fourier, Legendre, and, notable in this matter, Poncelet.

Following the 1815 Treaty of Vienna, the appointment of Monge's adversaries, LaPlace and Cauchy, to take over French science and destroy the work and influence of Carnot and Monge, resulted in a diaspora of the leading French science throughout much of Europe, especially into Germany, and to a most significant degree into northern Italy. This diaspora of leading French science included knowledge shared with some Italian collaborators, in electrodynamics, and, more broadly, the incompleted state of major advances in constructive-geometric methods accomplished under Monge's leadership.

It was in Prussia and among Gauss's circles in Göttingen University, that the post-1818 continuation of the work of the Monge Ecole Polytechnique was most advanced. Later, during the 1850s and 1860s, the scientific circles associated with Cavour in northern Italy made direct contact with Prof. Bernhard Riemann, collaborating with Riemann to establish the great Italian school of electrodynamics and advanced hydrodynamics around such scientific leaders as Betti and Beltrami.

man mind have also the same space-time curvature, although other aspects of human mental behavior do not.

The crucial practical importance of these four facts taken together, is that human knowledge of the universe around us would not be possible unless the human creative-mental processes had the same space-time curvature as the universe in general. It is the fact that the creative-mental processes are in projective congruence with the physical space-time curvature, which enables man to achieve successive improvements in scientific knowledge. This brings us back to the comparison of a hypothetical "primitive hunting-and-gathering society" with the results of scientific and technological progress. The fact that mankind has demonstrated scientific progress in this way, is sufficient proof that the space-time curvature of the creative-mental processes is congruent with that of the universe generally.

Of the three listed powers of the mind, it is the third which is of overpowering importance, whereas the other possibilities are relatively weak and presently speculative in nature.

This third power of the mind is available only as creative-mental activity, and not in the kind of thinking associated

This post-1815 diaspora of leading French science unleashed a great scientific ferment throughout Europe, and led to the establishment of German science as hegemonic in the United States until the close of the nineteenth century. To the degree that there was even a generation's span in the argued "simultaneity" of the work of Gauss, Lobachevski, and Bolyai, this concurrence reflected the varied impact of the work of Monge's circles, especially Legendre and Poncelet, on advances in constructive geometry.

More important than the alleged "simultaneity" were the fundamental differences in the product. Gauss, Dirichlet, Weierstrass, and Riemann represent an approach from the standpoint of a true "non-Euclidean" geometry, whereas the arguments of Lobachevski and Bolyai are presented in a "neo-Euclidean" form.

The public-relations treatment of Gauss and Riemann in this way had a well-established precedent in the work of James C. Maxwell. Many of the crucial features of Maxwell's own work in electrodynamics have been found to be parodies of the earlier discoveries of Gauss, Weber, and Riemann, contrary to the advertised view of reliance upon such sources as Faraday.

In a rather famous letter, Maxwell commented upon his debt to Riemann. He explained that what he had rejected in Riemann's work on electrodynamics reflected Maxwell's hostility to a method situated within a truly non-Euclidean geometry. In that same location, Maxwell summed up the point, that he had reworked various such sources to the purpose of excluding the award of credit to "any geometries but our own." In short, Maxwell situated the parodied materials in the deductive, Cartesian framework of Newton et al.

That is the way in which the authors of Special Relativity treated their unavoidable debt to Riemann.

Perhaps the single proponent of Special Relativity singly most responsible for establishing the myth that Riemann's geometry is "neo-Euclidean," was the enormously gifted Prof. Hermann Minkowski. He paid the strictest attention to this issue, and the leading accomplishments of Einstein and other celebrated proponents of Special and General Relativity owed a great scientific debt to him.

On the one side, Minkowski seemed to adopt the constructive standpoint of Riemann in insisting that, "henceforth," the separate ontological categories of "matter, space, and time" as previously entertained, must be discarded, and the notion of "physical space-time" must take their place. Yet, then, when we turn to Minkowski's mathematical exposition, even in that same published lecture, he employs as a starting-point the old Cartesian deductive, discrete manifold.

Later, the fact that Special Relativity defined from the starting-point of a deductive discrete manifold is filled with devastating physical paradoxes of the most elementary nature, led to proposing a theory of General Relativity. That notion of General Relativity is as flawed in the most elementary terms as Special Relativity, and is in fact worse than superfluous if we had but corrected the elementary ontological flaws in Special Relativity instead.

Today, there are ideological busybodies, such as the high priests of the Harvard and Johns Hopkins-based project in the history of the exact sciences, who effuse copiously the most awful factional rubbish, all in a manner resembling the way in which Moscow's high priests of "Marxist-Leninist orthodoxy" produce ritual ideological rubbish for the edification of the presumably erring faithful. Like Maxwell, the central commitment of those "science ideologues" is to outlaw by ukases "any geometries but our own."

This circle, such as Harvard's Cohen, produces the wildest outright frauds on the content of Kepler's writings, and on such other cases as the work of Dirichlet, Weierstrass, Riemann, and Cantor, creating an entirely fraudulent history of science, all to the included purpose of imposing their radical-empiricist dogmas, and defending that bureaucratic dictatorship over university science education which they serve as high priests.

The fraud, of attributing the name "non-Euclidean" to what are simply "neo-Euclidean" formalisms, has that same explicitly *political* character.

with deduction. From deductive thinking, we really know nothing with scientific certainty; had our species relied upon deductive thinking exclusively, this planet would have never had a human population significantly exceeding 10 million persons.

This creative power of the mind is that which defines persons as in the image of the living Creator. This is the substance of which the human soul is composed. Short of the Creator Himself, the power of mental-creative processes, even as represented by a single individual, is the greatest power in the universe.

Such is the issue posed by the proliferation of the satanic New Age movement in Colorado. Those cults are a denial of that which defines the individual person as human, and by so denying what is essentially human, they degrade themselves to a moral level more contemptible than the meanest of beasts.

A national security risk

The Soviet KGB has adopted a patronizing view of such cults; these, like the drug culture, help to destroy Moscow's hated adversary, the United States, from within. It is the same for the Soviet targets outside the United States. Since the 1920 Baku conference of the Communist International, attended by then-Soviet fellow-traveler Rudolf Hess from Germany, the use of particularist sorts of religious and ethnic cults was established as a principal weapon of Soviet subversion; it is so today, more than ever.

That 1920 Baku conference comes up prominently in the background to such cases as the Soviet spy-ring, including the late Soviet KGB Gen. Harold "Kim" Philby, deeply embedded for so long in the top ranks of British intelligence. A roster of other notable Western European personalities of the 1920s, besides Hess, attending that conference, puts us on the track of many significant connections, including the Reventlow center in Ascona, Switzerland.

The inner circle of Nazi leaders were members of the same family of cults spreading in Colorado today. Adolf Hitler is notorious for such lunacies as maintaining a court astrologer to advise him on the eve of important decisions. According to fat man Hermann Goering, Hitler believed he was personally the Antichrist, the twentieth-century reincarnation of the Isle of Capri's most notorious resident, the Roman Emperor who ordered the Crucifixion of Christ, Tiberius. Hess was deep into Tibetian occult mysteries. The list goes on.

This sort of cult spread widely among the idle classes of Britain during the decade following World War I, forming a group sometimes identified as the "Children of the Sun." As one among the elder figures of those circles, Bertrand Russell described the state of mind among many of the decadent class among post-World War I Britons:

> when I first became politically conscious Gladstone and Disraeli still confronted each other amid Victorian solidities, the British Empire seemed eternal, a threat to British naval supremacy was unthinkable, the country was aristocratic, rich and growing richer. . . . For an old man, with such a background, it is difficult to feel at home in a world of . . . American supremacy.

The effects of a World War I found a great portion of the young men of Britain left behind by Field Marshal Haig as corpses draped upon the barbed-wire of France's battlefields, formerly rich Britain sinking under a great mass of debt-burdened decay, and found much of the postwar generation of Britain in something resembling the deep cultural pessimism infecting the returning veterans of France and Germany. From a major power, Britain had been sunk abruptly to the status of a second-rate one. As for Bertrand Russell, for many of these, the world in which they had placed their confidence and sense of identity suddenly had ceased to exist. They were presented with a new world, which no longer interested them, with which they were very, very bored.

It was not difficult for the image of a new, brutish power emerging in the east to attract their impulses to relieve the inherent boredom of their jaded lives, by doing something really daringly wicked.

In Britain, this harked back to Thomas Huxley's use of Charles Darwin to bring the moral edifice of the Victorian Age toppling down. The Fabians have claimed that the origins of their movement's development into something of a mass-movement was the logical consequence of the way in which Huxley and Darwin demolished the ordinary Briton's faith in Bishop Ussher's calculation of the occurrence of Creation on a Monday morning in 4004 B.C. British socialism, that creation of the homosexual cult of "Pre-Raphaelites" around Oxford University's John Ruskin, could never have inspired a mass-based movement such as the Fabians without Huxley and Darwin. Fabianism developed as a pagan back-to-nature religion, and never departed far from those cultish origins. Fabian H.G. Wells preached that science and industry were the Morlochs, who must be destroyed. Such was the Fabian's worship of Dionysos.

In the United States, a similar pattern has been building up since approximately 1966-68. This was the time that the new-fangled "Liberation Theology" began to empty the pews of the Catholic parishes, the time when the New Left's merger with the rock-drug-sex youth counterculture echoed the call of the Nietzschean Mithraic Antichrist for "the transvaluation of the values" of Western Judeo-Christian civilization.

To punctuate this, there was the fact of the foolish war policy in Indochina, a war which the United States had already lost in fact with the Tet Offensive of 1968. The past 20 years have been a time for us like that in Britain, France, Germany, and Italy after World War I.

Look at the faces in the photographs accompanying Bor-

Stuart Lewis

Soviet intelligence has a great interest in promoting this sort of spectacle: A hard-rock performance at New York's Central Park, billed as "Rock Against Racism."

dewich's *New York Times* piece. What is their age today, and what was it back in 1966-68? A generation has passed. Every leading value which was accepted in the United States before 1966-68 has been turned upside-down. The second Reagan administration's pilgrimages to appease the Soviet dictatorship, combined with the collapse of basic economic infrastructure, of agriculture, industry, of the schools and hospitals, and the ravages of drug usage, promote a deep cultural pessimism.

We are near the edge of a plunge into a New Dark Age, like that of fourteenth-century Europe, perhaps worse. Day by day, new stresses are piled upon deepening cultural pessimism. The little flaws in formerly rational personalities become widening cracks, as millions, and yet more millions of Americans drift slowly into outright mass-insanity.

If you were a Moscow plotter, and desired deeply the rapid destruction of the power of the United States at the earliest possible date, with the least risk and exertion on Moscow's part, how would you calculate the effects of what is spreading in other parts of the United States, as well in Colorado? How would you respond to such developments; what different than that can you imagine Moscow to be doing?

In short, we are being attacked most effectively on our vulnerable metaphysical flank. Since we as a nation have become so deeply flawed by the superficial way in which even our educated professionals have equated rationality to formal logic, we find ourselves poorly equipped to resist the terrible infection of pagan superstitions spreading now so widely.

What must we do about all this? In part, it may be hoped that some of the answers to that question have been made obvious by this report. Understanding the nature of the sickness is fairly described as halfway to a recovery.