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An Understanding of Newton's First Law of Motion Seen in the Light of Aristotelian-Thomistic Principles of Measure

Part I

Charles B. Crowley, O.P.
St. John's University

FOREWORD

What is meant by a "law" in contemporary physics? Is it a hypothesis "freely Created" by the mind? Is it a "hypothesis which works" and "saves the appearances"? Is it a "fiction"?

If modern physical laws be any of the above, why do they "work"? Indeed, how can the Law of Inertia (upon which the whole of Newtonian mechanical, physical science is based) have been so successful for centuries, if it be based upon such flimsy foundations as these?

If true metaphysical laws judge the truth of the laws of science, are there some metaphysical laws to which the Law of Inertia conforms? If so, what are these?

Does the Law of Inertia contradict the classical philosophical, physical principle that whatever is moved is moved by another? Do the laws of modern physics conflict with those of classical metaphysics and with those revealed religion?

How is modern physics related to mathematics? Do the principles of mathematics have a metaphysical foundation? If so, what are they?

Can the unity of science be re-established within the context of philosophy? If so, how might this be accomplished?

These are just a sample of the many enigmatic and challenging questions which are addressed by Professor Emeritus C.B. Crowley in the following thought-provoking essay which, for the purpose of promoting a dialogue with those readers who are interested in the relation of contemporary physics to philosophy and, in particular, to metaphysics, *Contemporary Philosophy* has decided to serialize in three issues. We encourage interested readers to write us and tell us their reaction to this article (and to any of the other articles in the current or future issues) --some addition, we also encourage replies to the following article from serious scholars in the field.

Peter A. Redpath, Ph.D., Associate Editor

The question of the relation of the Galilean-Newtonian First Law of Motion, or the Law of Inertia, the first principle upon which Newtonian science of mechanics is based, to the Aristotelian-Thomistic first principle of motion upon which the Thomistic first proof for the existence of God is based, has once again come to the fore of the academic world.

This was occasioned by an article by Fr. Stanley Jaki,

O.S.B., the renowned priest-scientist, from Seton Hall, New Jersey, who on October 29, 1990 was invested by Pope John Paul II as a member of the Pontifical Academy of Sciences of the Vatican, with a follow-up article by Fr. Pierre Conway, O.P., the well known translator of the works of Aristotle and St. Thomas' Commentaries on those works, from the Pontifical University of St. Thomas, Washington, D.C. Fr. Jaki's article, titled "The Physicist and the Metaphysician," appeared in the *New Scholasticism*, Spring Issue, 1989. Whereas, Fr. Conway's article, titled "Defusing Science," appeared in the August-September issue of the *Homiletic and Pastoral Review*, 1990. Both of these articles deal with the correspondence between Fr. Garrigou-Lagrange, O.P., the metaphysician and theologian, and Pierre Duhem, physicist, philosopher and historian.

Fr. Lagrange was writing an article on God, in which he was using the proofs for the existence of God, and he was concerned with what came to be called "Newton's First Law of Motion (or Inertia)," which states that: "Every body continues in its state of rest, or of uniform motion, in a right (i.e., straight) line, unless it is compelled to change that state by forces impressed upon it," and the Aristotelian-Thomistic first principle of motion which states: "Whatever is moved is moved by another." These two principles, or laws, seemingly exclude, if not contradict each other in this: The Law of Inertia requires an external force ONLY to initiate change from rest to uniform motion in a straight line, or to change that uniform motion itself. Whereas, the first principle of motion requires a cause not only to initiate the change, but also to continue to produce the change within the uniform motion itself.

Fr. Garrigou was concerned because of the metaphysical principle of causality that: Nothing can reduce itself from potency to act, except by a being in act; which in the Thomistic natural philosophy of motion, states: "Whatever is moved is moved by another."

Because of this seeming contradiction between these two laws, Fr. Lagrange sought clarification from Duhem, not of the metaphysical principle, which he knew was ontologically true and certain, but of the scientific law. Garrigou was truly aware from his mentor, St. Thomas Aquinas, that there cannot be any conflict between the truths of the Faith and the truths of science, a position repeatedly stated later by Pope John Paul II. Since the Church, at Vatican Council I, had solemnly defined as an Article of Faith that unaided human reason could prove (i.e., demonstrate) with certitude the existence of God, and

although the Council did not specify what those proofs were, Thomistic philosophers and theologians have always maintained that the five ways (The *Quinque Viae*) of St. Thomas are true proofs, or demonstrations of God's existence, and that the first and most evident proof is taken from motion, which is based upon the philosophical principle that: Whatever is moved is moved by another.

What Garrigou was seeking was: How could the whole of Newtonian mechanical physical science be based upon a law that seemingly contradicts a fundamental law of reason? Such questioning by Fr. Lagrange implicitly indicates that he was understanding Newton's law as a PHYSICAL LAW, or as a real first principle of motion.

According to Fr. Jaki's article and that of Fr. Conway, Pierre Duhem quieted Fr. Garrigou's mind, and also that of Fr. Jaki and Fr. Conway, by pointing out what the laws of physics are not -- and what they are.

What they are not: They are not AXIOMS, as St. Thomas and the Scholastics understand "axioms," i.e., as self-evident certain true principles, needing no proof to make them evident, and therefore certain.

Secondly: They are not LAWS, as the scientists themselves understand "laws," i.e., general propositions reached by induction, from the teaching of experience (or from experiment).²

Thirdly: Duhem says, while certain facts (or rational probabilities) may SUGGEST them, such suggestions are NOT DEMONSTRATIONS, i.e., begetting certitude in the human mind. What they are, according to Duhem, are postulates freely posited by the mind from which deductively an ensemble of more or less consequences which agree with phenomena can be drawn. And this is all the physicist expects from his postulated principles. They are "HYPOTHESES THAT WORK -- SAVE THE APPEARANCES" and from which consequences may be drawn. Relative to the principle of Inertia, the physicist has no right to say that: IT IS CERTAINLY TRUE, NOR THAT IT IS FALSE.

These are problems that the method of the physicist is incapable of grappling with, and it leaves them to the free discussion of the metaphysician.

There is only one case which would induce the physicist to be opposed to this liberty of the metaphysician. It is that in which the metaphysician would formulate a proposition directly contradicting the phenomena, or a proposition which, induced in virtue of a principle in the physical theory, would lead to consequences in contradiction to the phenomena. In this case there would be just grounds for denying the metaphysician the right to formulate such a proposition.

By negating to the Law of Inertia both the status of an Aristotelian-Thomistic true self-evident certain axiom, and the status of a law in science, as drawn from experience, or experiment, and calling it a "free postulate of the mind," and a "hypothesis that saves the appearances," and "works" for the scientists, Duhem quieted the mind of Fr. Lagrange, and apparently that of Fr. Jaki and Fr. Conway.

However, that answer seems too simplistic and lacking metaphysical basis. For what strikes a philosopher with that answer is: How can the first principle of a science which has

been so successful scientifically for two hundred years be based on such a weak foundation? Surely there must be a more profound and firmer basis than "a free postulate of the mind," etc. If such is the case, then the philosopher can ask: Could not another, or opposite postulate be "freely created by the mind"? Or: is there something else that FORCES the scientists to make such a "postulate"? That is, is there some way in which Newton's "postulate" is based upon a metaphysical principle and therefore MUST BE TRUE?

Before answering that question, it should be pointed out that in past years Thomists have considered this problem of the Law of Inertia and the First Law of Motion.

In *The Thomist*, issue of April, 1956, Fr. Augustine Wallace, O.P., well known for his works on Galileo and Aristotle's influence on Galileo, wrote an article in that journal on Newtonian Antinomies Against the *Prima Via*. And in *The Thomist*, issue of April, 1974, Fr. Antonio Moreno, O.P., wrote an article entitled "The Law of Inertia and the Principle *Quidquid Movetur ab alio Movetur*."

The present author, because of the limitations of this article, will merely summarize the salient points of these authors, before establishing the point of view found in the title of this work, viz., an understanding of the Law of Inertia in light of the Aristotelian-Thomistic principles of measure.

First: re., Fr. Wallace:

Fr. Wallace, having stated that "from a textual analysis, it matters little in which order these [Newton's laws of motion] be considered," begins with "gravitational motion," wherein two bodies being the mutual cause of each other's motion, form a closed system in which no extrinsic mover is needed, let alone a first unmoved mover.

Father's reason for starting with "gravitational attraction" is, as he states, "using the concepts developed therein to reply to the antinomy based on the principle of inertia."³ The concepts developed therein are "gravitational attraction as force," and especially the term "force," as to how it is to be understood; that is: Is it a "physical pull"? but more especially how Newton himself understood it.

Fr. Wallace then goes on to show how insistence upon mathematics can replace physical aspects even though mathematics is a tool, to ask questions about the physical reality that lies beneath the description, which Newton espoused. Father then goes on to give an excellent analysis of natural motion and especially of gravitational motion, and shows that because Newton's inverse square law of gravitation ABSTRACTS COMPLETELY from an efficient mover, and merely states an equality that is found to obtain when the resultant motion is described mathematically. It is a physico-mathematical law of the relations of the measurable properties involved.

The present author's summary is admittedly brief, but is necessarily constrained because of lack of space.

Having shown that a mathematical equation is involved therein, Fr. Wallace now moves to the Law of Inertia. He points out that eight definitions and one scholium precede it, and that only the term "force" appears in the law and that only in a negative or accidental role: and in Definition VIII, Newton states that he is giving a mathematical notion of those

forces without considering their physical causes and seats.⁴

Wallace then states: "The real problem is the first part of the principle of inertia. How is it to be conceived? Is it physico-mathematical or purely physical and if the former, in what sense does mathematics enter it? And for him it is the key problem of this second antinomy."

He continues: No doubt it is not a physico-mathematical principle in the sense that it will ever enter an equation. It does not seem to express an equality that could be used in any other equation. It states what obtains in a LIMITED SENSE,⁵ and since such limit concepts pertain more to mathematical modes of reasoning⁶ than to physical ones [i.e., physical modes of reasoning],⁶ the principle is more physico-mathematical than physical. Father then refers to Definition V, which Newton stated prior to the First Law.

Definition V is on centripetal forces and bodies revolving in orbit which tend to recede from their centers, which but for a contrary force that restrains them in their orbits would tend to fly off in right lines with a uniform motion, and a projectile, which if it were not for the force of gravity, would not deviate towards the earth, but would go off in a right line, with uniform motion. From which Newton concludes: The less the gravity is, or the quantity of its matter, or the greater the velocity with which it is projected, the less will it deviate from a rectilinear course and the farther it will go.

From this proportion, i.e., of the less gravity or the greater velocity, the less deviation, Father Wallace sees the groundwork for the APPROACH TO A LIMIT. He also sees that "approach to a limit" where Newton continues about a leaden ball projected from a mountain top whose curved motion increases as the resistance of air is removed and the velocity increased would encircle the Earth AD INFINITUM.

Father then sees Inertia as a conclusion -- an inference drawn from a physico-mathematical approach to a limit, hence it is not a PURELY PHYSICAL PRINCIPLE, but PHYSICO-MATHEMATICAL.⁷ It is not self evident.⁸ It is not demonstrable.⁹ It is not found in ordinary experience. Nor can the last part of the proposition be taken as confirming the first part, for as Eddington had noted, "that every particle continues in its state of rest or uniform motion in a straight line, except insofar as it doesn't."¹⁰

Finally, THERE IS NO WAY OF PROVING IT TRUE.¹¹ It can be called a "dialectical" principle not explained, but perhaps and only perhaps meaning it approaches truth insofar as it is an inference from a limit, and limits also have limits, i.e., they are never attained, and since limiting cases are not always true, may never be true.¹² However, it is a useful principle and gives an IDEALIZED ACCOUNT¹³ of local motion.

Finally, Father concludes: Inertia states only a partial truth. It abstracts from efficient causality (even relative to compulsory motion). It is not explicitly mathematical but is based on a reasoning process, i.e., a physico-mathematical reasoning process, and invokes a limit concept in verification. And, being dialectical, because of its approach to a limit, the principle of Inertia cannot be proved to be true in a complete and self sufficient sense. And because it is not evident, either to experiment or reason, it cannot be invoked against the

validity of "Whatever is moved is moved by another."¹⁴

Re., Father Moreno, O.P.

As was said, when considering the above authors, limitation of space requires only a brief summary of Fr. Moreno's article, and being brief, is admittedly open to omissions.

Father begins his article by stating that all the fundamental principles of physics, among which he includes the Law of Inertia (which Whitehead called the first article of the Creed of science), are fictitious,¹⁵ and then goes on to say that all the great physicists were philosophers. Then he says that the Law of Inertia is not axiomatic (i.e., self-evident), but was PLAUSIBLE¹⁶ to Galileo, Newton and a majority of classical physicists. He then has recourse to Galileo rolling a sphere along an ideal frictionless floor (i.e., a horizontal plane), in a straight line to infinity, which Fr. Moreno calls a "thought experiment," and sees that experiment as passing to a limit. He says: Theoretically it is a particular case of the Second Law, and he gives mathematical equations illustrating his meaning. He concludes that "MAYBE,"¹⁷ and "PERHAPS"¹⁸ it can be formulated as a hypothetical law.

He sees a group of concepts SEMANTICALLY¹⁹ linked, such as, "uniform," "rectilinear" and "ad infinitum." And states that: laws can be formulated in an inertial coordinate system for motion that moves uniformly in a straight line. Such an inertial system requires absolute space, not affected by anything within it, that led to Einstein's theory of relativity, who saw Newton setting up absolute space and absolute Time.²⁰

Fr. Moreno then proceeds to correctly consider the difference between the Greek concept of motion, which is in terms of potency and act, and its reduction from potency to act, and that of the modern physicists, which is a quantitative description of a mobile body following a path. Having made this distinction, he then considers the principle of "*Quidquid movetur ab alio movetur*" as it is misunderstood by some modern philosophers and historians, and as understood by Aristotle and St. Thomas.

Starting with the notion of "nature" as an intrinsic principle of rest and motion as it pertains to a subject, he then very clearly shows that nature, although it is an INTRINSIC PRINCIPLE of motion, it is not an active power and form is not a pusher, but he does LIKEN²¹ the Law of Inertia, with its absence of forces, to Aristotle's natural gravitation.

He then discusses Aristotle's notion of violent motion, i.e., motion that is contrary to natural motion, in this, that unlike natural motion, which is from WITHIN a mobile body, but is EXTRINSIC to that mobile body, as is found in projectile motion, wherein Aristotle maintained that the agent imparted motion both to the body, and he also gave to the medium motion and a power to move that projectile, such that the medium would itself be moved, and be a mover of the projectile.

Here Fr. Moreno abandons the notion of the air being a mover, and adopts a theory of "impetus," which he maintains is a development of Aristotle. He concludes that we do not know what inertia is, and that the basic concepts of nature are unknown to us.

Here a few remarks are in order. First: In referring to all

the fundamental principles of physics, including the Law of Inertia, as "fictitious," Father runs the risk of being misunderstood philosophically and perhaps scientifically. For, if by "fictitious" is meant what Thomistic philosophers have traditionally meant by that term, viz., the realm of such "being," or "things," as centaurs, etc., it is hardly thinkable that all of science is based on principles such as that. However, if by "fictitious" is meant "imaginary," as the Thomistic philosopher uses imaginary for the realm of mathematics, i.e., as the term of mathematics, then in the order of measuring, his use of such a term is ineluctable, to say the least, for it would tend to turn the scientist away from Thomistic philosophy. It is better to affirm what the principles of modern science are, i.e., principles of measure.

Moreover, to assert, as Father does, that the "impetus theory" is a *development* of Aristotle is highly questionable, since St. Thomas says, in *De Caelo et Mundo* [Bk. III, Lect. 7, n. 678], that to "impart ANY 'VIRTUTEM' in the projectile, after the manner of the generator imparting a form to a heavy or light body, is *contrary to the notion of violent motion*. Perhaps modern science's notion of AIR PRESSURE on the projectile would be more of a development of Aristotle's teaching of the movement of the air on the projectile as an *extrinsic*, and so a violent mover of the projectile, rather than the "theory of impetus."

Furthermore, when Fr. Moreno lists Galileo, Newton, Einstein, etc., as philosophers of nature, without distinguishing the term "philosopher," he again can be misleading. For, since the term "philosophy" is about the NATURE of things, and according to Aristotle and St. Thomas, speculative philosophy has three parts: First Philosophy; Second Philosophy; and Third Philosophy, which is mathematical philosophy, one might think that those physicists whom he lists were philosophers, as metaphysicians and natural philosophers are philosophers, rather than as mathematical philosophers are philosophers, i.e., philosophers of quantity as a measure of reality, as Aristotle would see them.

Then, taking up the Law of Inertia, Father says: It is not axiomatic (self-evident); and this is correct, as the above authors have also stated. He says, however, that it was "plausible" to Galileo, Newton and a majority of classical physicists. Here, one can question what "plausible" refers to.

That is, plausibly true? "True" meaning here in accord with reality? Or plausibly real? One wonders whether Newton himself thought of his Law of Inertia as "real" in any sense, since he constantly refers to himself as being in the mathematical order, i.e., the order of quantity as a measure, and the principles of measure, as the very title of the *Principia* states, namely, the MATHEMATICAL PRINCIPLES (i.e., the measuring principles) of NATURAL PHILOSOPHY.

Fr. Moreno then has recourse to Galileo's rolling a sphere along an IDEAL frictionless surface (i.e., horizontal plane) in a straight line, which Father calls a "thought experiment," and from which Father passes to a "limit." He then states that theoretically it is a particular case of Newton's Second Law, and gives mathematical equations to support this position. Fr. concludes that "maybe" and "perhaps" it can be formulated as a hypothetical law.

He also sees a "group of concepts" semantically linked, such as uniform, rectilinear and ad infinitum. He says laws can be formulated only in a coordinate system, that moves uniformly in a straight line in an inertial system. This system requires absolute space and absolute Time, not affected by anything in it, which also leads Father to speak of Einstein's relativity, etc.

Throughout this entire article one sees Father struggling to identify the nature of the Law of Inertia. He knows it is not a physical law: it is not self-evident: it is not axiomatic and yet there is something about it that cannot be denied.

The problem is: What kind of law is it? That is: What is its nature? Duhem, Fr. Jaki and Fr. Conway see it as a "free postulate of the mind." Fr. Wallace sees it as an "inference" from a mathematical method of reasoning, i.e., from a limit, and as dialectical. All these authors are clearly attempting to determine its nature. Since it is a question of its nature, and it is a first principle of Newtonian mechanics, one must then turn to metaphysics to determine its nature, for it belongs to metaphysics to study the nature of the principles of all the other sciences, and consequently to determine the nature of the first principles of Newtonian mechanics, viz., the Law of Inertia.

Because Aristotelian-Thomistic metaphysics considers the principles of all things, it should come as no surprise that there should be found in that metaphysics principles of measure and measuring, upon which principles the measuring scientists, whether knowingly or not, depend and which they use. It is to manifest the dependence and use of Newton's First Law of Motion on the Aristotelian-Thomistic principles of measure, and in the light of those principles to examine the nature of Sir Isaac's law that is the purpose of this article. However, in order to do this it is necessary to show in general the different ways in which "ONE" is said, because it is in a "ONE" that the notion of measure is first found, and that there is a ONE which is the first principle of measuring.

NOTES

1. Denz, 1785; and especially 1806.
2. Parenthesis by present author.
3. Ibid.
4. Ibid. p. 175.
5. Emphasis ours.
6. Brackets ours.
7. Emphasis ours.
8. Cf. p. 178.
9. Ibid.
10. Cf. p. 179. *The Nature of the Physical World*. The Macmillan Company, New York, 1937, p. 124.
11. Emphasis ours. TRUE here meaning in conformity with real motion, or motion in reality.
12. Cf. p. 180.
13. Emphasis ours.
14. Cf. p. 186.
15. Whitehead, A.N., *Essays in Science and Philosophy*. London, 1948, p. 171.
16. Emphasis ours.
17. Emphasis ours.
18. Emphasis ours.
19. Emphasis ours.
20. Einstein's Theory of Relativity is not of concern here.
21. Emphasis ours.
22. Arist., *Meta.*, Bk. V, C. 6, n. 423. St. Thomas, *Comm. on Meta. of Arist.*, Bk. V, L. 7, n. 843. Also, Arist., *Meta.*, Bk. X, C. 1. St. Thomas, *Comm. on Meta. of Arist.*, Bk. X, L. 1. n. 843.
23. n. 843.
24. n. 848.

Implications of a Free Technology

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I. Introduction

It is my purpose here to explore certain ideas from anthropology indicating that freedom of technological innovation is directly related to social and economic progress. We are frequently reminded that social and economic progress are based in political reforms. Rarely are we told that social and economic progress is equally dependent on technological advancement and that political liberation means little without corresponding freedom to engage in technological innovation. In the West, the power of technology to transform culture has been augmented by applications of scientific thinking that have enabled the craftsman and his modern equivalent, the engineer, to transform Western cultures in profound ways. Western science has been joined with technology to create an explosive impetus for change that continues to transform not only Western technology, but virtually every other aspect of Western culture. So-called "stationary" and "changing" cultures may be contrasted in terms of the role of technology in each. So-called stationary or traditional cultures are characterized by a relative absence of technological innovation. The absence of such innovation encourages caste-like social structures and fatalistic philosophies, whereas technological innovation tends to encourage more open, achievement-based social structures and philosophical systems that emphasize the power of mankind to control their destiny.

Anthropological research has often focused on the material aspect of human cultures and its relationship to the non-material aspect. A materialist view of prehistory, history, and general culture evolution continues to inform the thinking of many anthropologists, especially those concerned with accounting for why some cultures evolve rapidly and other remain stable for lengthy periods. It is commonly held that freedom to innovate technologically is a major reason for rapid cultural evolution. It should also be noted that such rapid cultural change has been very disruptive not only in Europe but also in contemporary, non-Western cultures.

II. A Materialist View

The power of technology to change social patterns has been noted by various anthropologists such as Barnett(1953) who states that:

"Practically every intention does in fact necessitate more than one innovative step. The initial conception may be simple, but its realization usually entails numerous contributory adjustments." (Barnett 1953:230)

Another anthropologist, Leslie White (1959) states that:

"The technological factor is the basic one; all others are dependent upon it. Furthermore, the technological factor determines, in a general way at least, the form and content of the social, philosophic, and sentimental sectors."(White 1959:19)

White continues:

"As a matter of fact a social system might well be

defined as the way in which a society makes use of its particular technology in the various life-sustaining processes." (White 1959:19)

White then draws the conclusion that:

"If social institutions are shaped by the operation of technologies, then social change will tend to follow technological change." (White 1959:19)

One of White's students, Betty Meggers, describes what has come to be known as the "Law of energy and cultural evolution" as follows:

"This law is based on the recognition that all cultures are composed of three general classes of phenomena: technology, social organization, and philosophy. Of these, technology is primary and determines the content and form of the other two components." (Meggers 1960:302-3)

V. Gordon Childe in various publications (1925, 1936, 1946, 1956, 1958, and elsewhere) argues in a manner similar to Leslie White and demonstrates that it is freedom of technological innovation that has permitted the historic transformation of medieval into modern European society. He observes that when the free craftsman has been controlled by despotic regimes and by other elites, such as the clergy, such social transformation is rarely evident. According to Childe it is only where the craftsman is free of such restraint that technological progress can be achieved on a sustained basis. Without the freedom to innovate in technology, new sources of energy and power necessary for social transformation do not become available. Childe describes both ancient and modern examples of despotic regimes who opposed technological innovation producing long-term social and economic stagnation.

This anthropological view has been described more recently as "cultural materialism" by Marvin Harris:

"Translated into research strategy, the principle of techno-environmental, techno-economic determinism assigns priority to the material conditions of sociocultural life, much as the principle of natural selection assigns priority to the study of differential reproductive success.

(Harris 1968:4)

In general, therefore, anthropology may be said to have reached the conclusion that transformation of the material aspect of culture is a necessary condition for cultural evolution and change. It is my view that political reform without freedom of technological innovation is generally self-defeating. Until the craftsman and engineer are free to follow their own insights and pursue their own goals free of undue social restraint, little change is possible. Technological progress must become self-generating and self-sustaining rather than remaining dependent on diffusion from more technologically advanced societies.

III. Developed and Underdeveloped Nations

In certain underdeveloped nations there is a generation of

the past that obstructs social change and the introduction of most new ideas. Only limited types of Western technology are allowed to enter these nations, e.g., military weaponry, certain agricultural innovations, and some new medical practices. Despite a common opposition to Western scientific skepticism, the non-Western experience has been that adoptions of Western technology lead to unanticipated and often uncontrollable social consequences as noted by Lewis above. An initial admiration for Western technology and its associated scientific ideas and habits of thought. Neo-Primitivists in Western society increasingly voice similar doubts about the benefits of Western technology in their own lives. It is a far different thing, however, to voice such doubts from a pinnacle of technological achievements in Europe or America than from a very traditional, Third World society that possess only limited portions of the Western technological-scientific complex.

In a recent description of the clash of Christian and Islamic civilizations Bernard Lewis (1993:1-9) argues convincingly that the technological progress of the Christian West is not only the cause of Islamic decline in world dominion, but that it is also a major cause of Islamic hatred for the West. The insidious effects of Western ideas, and especially Western technology and its associated scientific thinking, continue to erode the traditions of Islam that govern social, political, and economic relationships of man to god, man to man, man to woman, man to child, man to society, and even man to nature. This emerging love-hate relationship between Islamic and Western cultures is reflected in an intensifying Islamic war against secularism and modernity. There is little doubt that growing secularism and modernity in the Islamic world are related to the adoption of Western technology. Islamic fundamentalists and others must resolve the contradiction in their desire to retain their traditional culture with its archaic social structure and philosophies unchanged and their desire to acquire portions of the Western technological and scientific complex for military and other purposes. It is increasingly clear that they cannot have both.

IV. Implications

What are some implications of this brief anthropological discourse on social and economic progress?

- 1) Social and economic progress are linked directly to freedom of technological innovation and the creation of a self-generating technological complex.
- 2) The Western technological complex and its associated scientific thinking pose many threats to traditional cultures of the Third World.

3) It is very difficult to confine the social, economic and other changes that come from adopting Western technology and its associated scientific baggage.

4) Social changes occurring in the Third World in the wake of technological innovation are producing a growing rejection of Western secularism and modernity.

5) Philosophical and religious systems in the Third World are often incompatible with Western scientific and philosophical systems and are under siege by Western-trained intellectuals, technicians, engineers, and others.

6) The tension between Western and Third World philosophical and religious systems will probably increase as more secularization and modernization follow adoption of increasing amounts of the Western technological and scientific complex. The more obvious and threatening these changes become, the greater the call will be for return to a fundamental vision of a purer, traditional culture.

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The Nature of Democratic Authority

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Democratic activity, like any other form of activity which exists in the world in which we actually live our everyday lives, does not exist in isolation. Rather, it co-exists within the context of a myriad of other activities--physical, social, and cultural--which, more or less, support or endanger the survival of democratic activity as such. Just as the life-activity of plants can be nourished or destroyed by the sun, the wind, and the rain, so, too, the survival and strength of democratic activity depend upon the latter existing within a complex context of compatible activities which can help it to grow and to mature or can destroy it.

Democratic activity is not a type of action which necessarily has to exist. It is not the type of activity which is produced by all species of physical beings, but only by some of them--by human beings; it is not the type of activity which, in fact, is practiced by necessity by human beings; nor is it the type of activity--like breathing or growing--which is practiced by all human beings. Indeed, even now in the last decade of the twentieth century democratic activity is practiced by only a small portion of the earth's population.

To exist and to flourish democratic activity depends upon the co-existence of certain necessary physical and psychological factors which support its survival. One such factor is, obviously, physical activities which promote the conditions of human life. If such conditions were non-existent--if, for example, the universe were to become uninhabitable for human beings--it is evident that, as an activity produced by humans, democracy would not exist either. The focus of this paper, however, is not upon physical activities as such which influence the existence of democracy. Rather, the focus of this research is upon certain psychological activities (that is, habitual activities of intellect, will, and emotion)--or on what I broadly categorize as "cultural activities" which make a social order more or less inhabitable or uninhabitable for democratic activity.

Democratic activity is not the kind of action performed by an individual person as individual. If only one person were to exist, obviously, democratic activity would not and could not exist. Democratic activity is social action. Consequently, it requires that a multiplicity of people exist and that they act together in some collective way. The collective way in which these people co-operate, in turn, must be a political form of co-operation if an action is precisely to be identified as democratic.

Political action, however, presupposes the existence of a complex organization of a multiplicity of human associations, many of which cannot exist without the simultaneous existence of sophisticated cultural development. While I thoroughly agree with Plato's claim in the *Republic* that, because no one is self-sufficient all human beings (including social contract

theorists, I might add) are inclined by nature to achieve political union,¹ such a more perfect union, as Plato himself well recognized, cannot be realized without cultural improvements to specific human acts.

The existence of cultural activity, however, depends upon the existence of skill. People are specifically inclined to improve their lives through the acquisition of habits of right judgment and habits of right choice. Such habits in the areas of theoretical, practical, and productive knowledge constitute the defining characteristics of a culture, and the rudimentary conditions of association needed for the existence of political life. People who cannot read, who cannot write, who have no language, no education, no economic order, no sculpture, no music, no painting, no theatre, no manufacturing, no agriculture, no morals, no legal system, and no structures for maintaining and transmitting such habits to succeeding generations cannot accurately be said to have a culture--nor are they suitable subjects for political government.

To maintain and to transmit cultural habits, however, it is necessary for human beings to establish cultural associations of various sorts--primarily related to arts, sciences, and morals; and, consequently, without the existence of cultural associations as a necessary intermediary stage in human social development, no society of humans can grow into any political order--much less into a democratic one.

Such being the case--that is, since the road from the birth of a solitary underdeveloped human being to the maturely developed life of a political citizen is a long and complex passage through the dimension of human culture--it is reasonable to expect that various cultural conditions will be more or less conducive to the existence, maintenance, and development of political structures in general and to the existence of democratic action in particular. One does not have to be a rocket scientist, I think (nor even a philosopher, for that matter), to recognize that the existence and flourishing of democratic activity is more or less compatible with certain cultural associations--in particular, with economic, moral, religious, and philosophical ones. Similarly, I think it should be easy to recognize that the way a culture understands the concept of authority in general and political authority in particular is more or less compatible with the existence of democratic institutions and of democratic action. For the concept of authority, like the concepts of freedom, equality, and justice,² is one of those "great" and pervasive ideas which exercises an influence over the way we think about almost every other idea related to social, cultural, and political association.

Given the importance and extension of influence of this idea, it seems rather odd, then, that, at least for many twentieth century Americans, if not for most Westerners in general, "The

issue of authority has such a bad reputation that a philosopher cannot discuss it without exposing himself to suspicion and malice.³ Indeed, the reputation of authority is currently so bad that I would not be surprised if the very title of my paper--"The Nature of Democratic Authority"--were to appear to many Americans as an oxymoron.

Why is this? Why is it that many people, as Yves R. Simon has accurately observed, "distrust so intensely a thing without which they cannot, by all evidences, live and act together?"⁴ I think if we consider this question for a moment we might gain some valuable insight into the nature of authority in general and of democratic authority in particular.

As a personal exercise of my own related to this emotional attitude, I considered some of the more common understandings that I associate with the term "authority." This is what I came up with: expert, superior judge, highest judge, director, executor, source, originator, measure, rule, commander, power, prime mover.

It seems to me that, in some way, all these ideas are synthesized in the concept of authority. If such be the case, why is it that the notion of authority incites such a negative reaction in the West? What could there possibly be in such ideas as concluding and superior judge, expert, director, measure, rule, and so on, that could grate so intensely on the emotions of so many Westerners?

I think a number of reasonable answers can be given to this question, but, since the reaction is one made on the level of practical human experience, it is not unreasonable to suspect the cause, too, might lie on the level of practical experience. That is, Westerners today in general tend to be suspicious of authority, or of those who claim to have it, because practical experience has taught them suspicion of authority is a quite reasonable stance to take. Indeed, for people such as Americans, who have had the practical experience of founding a whole new political order upon the decentralization of political power and administration, such a posture should seem even more reasonable. For centralization of power and administration appear to be essential notes of authority.

Furthermore, one might add that, by its very nature, democracy tends to be suspicious of authority because democracy tends to reduce all social relationships to the level of equality. In democracy equality tends to become the highest good and final cause of action, and since the concept of authority essentially involves a division into higher and lower--that is, a hierarchy--by its very essence the notion of authority tends to offend some parts of the democratic spirit.

The tendency of the concept of authority to offend the modern Westerner is also rooted in religious and educational orders. In the modern age the impulse towards democracy has been largely spearheaded by that religious group so many Westerners have found it fashionable to "love to hate"--W.A.S.P.s. If not based upon a total rejection of authority, the Protestant Reformation at least substantially sought to alter the sources of authority upon which reasonable people might reasonably agree; and this alteration of sources of authority found a parallel development in education with the ideology of the Enlightenment, beginning with Descartes's principle of the *Cogito*, and found a "more determinate form when," as Yves R.

Simon has observed:

"...some time in the eighteenth century, the ideal of a social science built after the pattern of physics got hold of minds and imaginations. The essentials of this epoch-making adventure can be summed up as follows: Western men had become aware that their control over physical nature was immensely increased whenever scientific propositions replaced common experience as the theoretical basis of their action. As far as physical nature is concerned, wonders can be worked by arts grounded in scientific formulas. Why should it be impossible to do for society what is being done so successfully in the realm of physical nature? Why should it be impossible to work out a social science patterned after physics, and like physics objective, impersonal, free from value judgments, exact, rigorous, indifferent to national or personal whims and preferences, necessary and irresistible? From such a science a rational art would be derived, and the proper conduct of societies would be insured by the impersonal decisions of enlightened reason. In the construct of a society ruled by the power of social science, authority plays no part."⁵

Finally, there is one other factor which I think has caused the twentieth century Westerner to be suspicious of authority--that factor is post-Enlightenment irrationalism. The modern scientific revolution and its resulting reduction of social science to the pattern of physics has produced in the contemporary age an alienation of freedom and Enlightened intellect. The reason this has occurred belies, I think, a portion of Yves R. Simon's above observation about the power of social science and simultaneously sheds considerable light upon the nature of authority in general.

In the last sentence of the above-cited quote, Simon had said, "In the construct of a society ruled by the power of social science, authority plays no part." In my estimation this conclusion goes too far, and the reaction of contemporary irrationalism to the imperiousness of contemporary social science constructs of society is good evidence for its inaccuracy.⁶ Authority plays a part in every construct of society. Hence it is impossible for it not to play a part in a society ruled by the power of social science. What social science began to do in the eighteenth century was not to deny the concept of authority but to reduce the whole of authority in political matters--as well as in all matters in any way involving human knowledge--to Enlightened reason. This, in turn, led to nineteenth and twentieth century reactions to the imperiousness of Enlightened reason in politics. Nursed in the thought of the Enlightenment, and suckled by its reductionistic claim to encompass the whole of human knowledge, numerous individuals in the twentieth century have turned to irrationalism as the only means of safeguarding their freedom, which they have come to understand to mean unorganized and unrestrained spontaneity of action.⁷

This reaction on the part of irrationalism in defense of freedom is interesting for many reasons--one of which is for what it reveals about the relationship of freedom to authority. For in its reaction against the imperious rule of Enlightenment reason, contemporary irrationalism throws a great deal of light on a common thread running throughout all five of the contemporary sources of suspicion of authority which I have

mentioned in this paper—that is, 1) the practical political experience with tyranny which led to the founding of the American republic; 2) the egalitarian tendencies of democracy considered in itself; 3) the Protestant Reformation; 4) the Enlightenment intellect; and 5) contemporary irrationalism. What is this common thread is not simply a reaction against authority (if, indeed, it is that at all) but also a movement which conceives of itself as pursuing freedom.

This common thread is interesting—for, if nothing else, it suggests a strongly perceived connection between acts of authority and acts of freedom. Indeed, beyond this, it seems to suggest a historically experienced incompatibility between the two.

What I wish to argue, in the spirit of Yves R. Simon before me,⁸ is that, in point of fact, authoritative acts and free acts are not incompatible at all. On the contrary, authority is a necessary condition of any type of human freedom—and, in fact, it is precisely because of the necessary dependence of human freedom upon authority that the apparent conflict between freedom and authority arises.

In point of both historical and natural fact, there is no conflict between authority and freedom. Indeed, far from being naturally inclined to avoid authority, human beings seek it out on all sides to bolster their developing freedom. Indeed, so important is the activity of authority to the existence of human freedom that people strongly recognize the need not to make mistakes about correct identification of authorities. For acts of authority are the natural conditions under which free acts are both brought to their maturity and are exercised well. Acts of authority, in a sense, are the atmosphere upon which breaths of free activity depend. So while some acts of modern history seem to reflect an incompatibility between authority and freedom, these same acts, when considered from a different perspective, suggest the reverse. In fact, the very same historical sources of suspicion about authority to which I have already referred in this paper can just as easily be viewed as supports of authority. For the founding of the American republic, the Protestant Reformation, the Enlightenment, and contemporary irrationalism each in its own way, can be seen as rebellions not against authority but against abusive and/or apparent authority.

Clearly it is impossible to dispense with acts of authority and, at the same time, to build a political order. Political orders are built through cultural development, and cultural development requires the existence of cultural associations and organizations. Cultural associations and organizations, however, cannot be developed without authority. The formation of cultural associations and organizations requires both co-operative effort and cultural structures for maintaining and for transmitting collections of information from one generation to the next; but neither co-operative effort nor cultural structures for maintaining and transmitting collections of information from one generation to the next can be achieved independently of authority. For the nature of common action itself requires the existence of authority.⁹ Common action, in turn, demands the synthesizing of a plurality of individual acts produced by people of many different levels of skill; and cultural and political development require continual and

sustained improvement in the forms of common practical action. Such a complex synthesis for sustained growth of co-operative effort, however, is impossible without authority.

The reason why this is so is because unanimous adherence to a common goal (which is a necessary condition of co-operative effort) need not entail unanimity regarding the means to achieve that goal. As people maintain a sustained growth in their freedom and skill, they improve their ability to distinguish between real and imaginary means and conditions to reach their goals. Freedom, as Yves R. Simon has rightly observed, is not simply an indifference and a lack of external determination. When rightly understood in its complete nature, freedom is recognized as an active indifference produced by masterful choice.¹⁰ In other words, freedom, when skillfully exercised is an activity which tends to multiply a person's choices of the actual means which successfully lead towards a desired goal. "...Improved knowledge rules out illusory means," Simon says, "and, insofar as it entails greater power, multiplies the genuine ones. To destroy the illusion of a means is not to cut the amplitude of choice, for insofar as it extends to illusory means, choice itself is but an illusion."¹¹

"In short, wealth, health, and strength are factors that cause independence from particular courses of action, dominating indifference, mastery over several means. Plentitude causes choice, poverty leaves no choice. Deficiency, such as lack of knowledge, may render the genuine means undistinguishable from the illusory one and thus make a plurality of means appear where there is really no more than one. But fullness, actuality, determination, achievement, accomplishment, power, and greatness, knowledge and stability, produce or increase liberty in societies and individuals as well. A society enjoying a supremely high degree of enlightenment would, all other things being equal, enjoy much more choice than ignorant societies and have to choose among many more possibilities. It would not need authority to choose between two courses of action one of which would lead to disaster, since, by hypothesis, knowledge would rule out illusory means.

But it would need authority, more than ever, to procure united action, for, thanks to better lights, the plurality of the genuine means would have increased considerably. The function of authority with which we are concerned, i.e., that of procuring united action when the means to the common good are several, does not disappear but grows, as deficiencies are made up; it originates not in the defects of men and societies but in the nature of society. It is an essential function."¹²

In other words, all societies need authority because diverse and opposite means, if actually pursued by members of a society, abolish social unity by destroying co-operative effort. As a means of obtaining a goal become more diverse and opposed in a society, it becomes increasingly necessary to have an intelligent source of directive action with the power to regulate minds and to impress a universal tendency of action upon the wills of social members.¹³

Clearly, in any political society just such a condition of diversity and opposition of means exists. For a political society presupposes cultural development. What is unique about a democracy is not that it rejects the notion authority but that it recognizes the finite limitations and the need for development

of authority itself and the difficulty which people very often tend to have in recognizing authority. In addition, it recognizes that cultural institutions, at times, outgrow their authorities. The nature of political authority, in other words, must be determined against the background of the cultural institutions and the individuals over which the authority is to be exercised.

Human beings are fallible, and so, too, are their cultural institutions. The evidence of this truth is something at the core of the modern democratic spirit. Recognizing the fact that very often people make mistakes, and that so, too, do their directing agencies, democracy inclines towards institutionalizing overriding regulating institutions subject to growth, refinement, and even to replacement.

It is precisely the recognition of the fallible nature of human beings which, I think, lies at the root of the nature of democratic authority. Democratic government seeks to foster united human action through mediating political structures which are compatible with the continued and sustained growth of justly exercised individual freedom of choice. Political authority, by its very nature, is one such mediating structure. Democracy rules through authority, but this authority is ultimately centralized in the nature and just and competent direction of action exercised by the free, co-operative, and cumulative prudential choice of individual and fallible human beings.

The concept of authority which is compatible with a democracy, therefore, is an analogous one which is compatible with the just direction of free and fallible persons by the collective practical wisdom of free and fallible persons. In a sense, it is an authority of sinners whose subjects of direction are, likewise, sinners.¹⁴ As such, democratic authority is not only practical in nature but also constantly open to reformation and improvement; so, by its very nature, it seeks both to diffuse

itself and to limit itself. Actually, in conclusion, that such is the nature of democratic authority should come as no surprise to any modern thinker. For is not the concept of Reformed Authority just the sort of notion which would be found politically attractive by W.A.S.P.s?

ENDNOTES

¹Plato, *Republic*, II, 369B.

²See Mortimer J. Adler, *Six Great Ideas* (New York: Macmillan Co., Inc., 1979).

³Yves R. Simon, *A General Theory of Authority* (Notre Dame and London: University of Notre Dame Press), 13.

⁴*Ibid.*

⁵*Ibid.*, 17.

⁶Actually, on the basis of a consistent application of his own principles, I think Simon would agree with me on this point. Thus see, for example, what Simon says in note 12 below about the universal social dependence upon authority.

⁷See Etienne Gilson's sage observations in *The Unity of Philosophical Experience* (New York: Charles Scribner's Sons, 1965), 271-278, about the nature and consequences of this development of uniting human freedom and irrationalism.

⁸See both Simon's *A General Theory of Authority* (note 6 above) and his classic *Philosophy of Democratic Government* (Chicago: University of Chicago Press, Midway Reprint, 1977).

⁹Yves R. Simon, *A General Theory of Authority*, 42.

¹⁰On this notion of freedom, see another Simon classic *Freedom of Choice*, ed. Peter Wolff with a foreword by Mortimer J. Adler (New York: Fordham University Press, 1987). See also his chapter on "Democratic Freedom" in his *Philosophy of Democratic Government*, 72-127.

¹¹Yves R. Simon, *A General Theory of Authority*, 45.

¹²Yves R. Simon, *Philosophy of Democratic Government*, 33. See also note 16.

¹³*Ibid.*

¹⁴I am deeply indebted to Michael Novak's brilliant observations regarding the relationship between the concept of original sin and the contemporary concept of democratic capitalism for my own observations about the concept of democratic authority being dependent upon a Reformed view of authority. See Michael Novak, *The Spirit of Democratic Capitalism* (Lanham, Maryland: Lanham Books, 1991).

The Welfare State, Poverty, and Economic Opportunity

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Executive Summary

* President Lyndon Johnson's War on Poverty promised to alleviate poverty, improve the economy, and lessen the social and political divisions in American society. Its results have been the opposite.

* Thirty-five percent of Americans were living below the poverty line in 1950. Starting in 1950 this rate declined steadily to 13 percent by 1968, four years after the start of the War on Poverty. Today the poverty rate remains at 13 percent.

* People stay poor because the welfare system destroys their incentive to work. A mother receiving \$10,000 in welfare who gets a job paying \$7 an hour (\$14,000 a year) immediately loses her welfare payments. After paying for child care, transportation, uniform costs, she may actually take home less by working than by not working.

* The out-of-wedlock birth rate among American blacks in the mid-1950's was 20 percent. By 1989, it had reached 65 percent. The fact that Sweden, until recently the world's preeminent welfare state, has a 50 percent out-of-wedlock birth rate dispels the myth that births out of wedlock have anything to do with race or with black culture.

* One-half of the single parent households in the U.S. live in poverty, whereas only 6 percent of two-parent households do. More than 70 percent of the juveniles in state reform institutions are from single-parent households. Children from these families generally perform less well in school.

* The system can be reformed. President Clinton, in his address to Congress in January of 1993, proposed to limit benefits to two years, after which recipients would have to work to receive ongoing payments. This reform should be implemented. In addition, mothers already on welfare should not receive increased benefits when they have additional children. Other reforms that link benefits to responsibilities should also be considered.

Introduction

The growth of the welfare state has transformed American politics. The expansion in government welfare programs has brought with it an alarming increase in the number of non-working poor people, and the social reforms intended to help the poor have instead had the result of pushing them further from the American mainstream. Decades ago, public policy toward the poor was concerned with providing jobs for them, whereas today the focus is on transferring wealth from working families to non-working families. This new politics of dependency prompts the question of why so many low income individuals either cannot or will not work. The public policies designed to help the poor have instead created a permanent

underclass of people dependent on the government for their support. They are demoralized and alienated from the working majority, and have become victims of the system that was created to help them.¹

The War on Poverty

In March of 1964, President Lyndon Johnson initiated the War on Poverty, saying, "I come to you today with a call to arms for this nation's unconditional war on poverty. It will be a long, hard, costly war, but it offers us rich rewards: in a stronger people, in a stronger economy, in a stronger democracy. And America is well armed to win this war: no nation on earth can match our prosperity. We manufacture nearly half of the world's goods. Our granaries are full. Our wage and profit levels know no equals. To use some of that great bounty to wipe out the shameful poverty in our midst is a challenge to which all America is responding. Let us now translate that response into action. Let us do so promptly, but not hastily--without wasting time, yet without wasting money. But let us begin." Nearly thirty years after President Johnson declared the War on Poverty, it seems reasonable to use his challenge to evaluate its success. The rich rewards President Johnson alluded to have not materialized. Rather than making a stronger people, we have a permanent underclass dependent on government welfare; rather than making a stronger economy, our economy is weaker; rather than making a stronger democracy, our political system has become more polarized.

The War on Poverty was declared at about the same time the war in Vietnam was accelerating. By 1973 we recognized that we could not win the war in Vietnam, and ceased trying, but 20 years after the conclusion of the Vietnam war we are still fighting the war on poverty. The statistics indicate that there is as much poverty in the United States today as there was when the War on Poverty began. Is the War on Poverty also unwinnable, like the war in Vietnam? If not, what are we doing wrong? How could we be more successful?

First, let's look at some facts. In 1950, when the first reliable government statistics on poverty became available, approximately 35 percent of the American population was living below the poverty level. Over the next decade and a half, the poverty rate declined continually, and by 1968 the percent of the population living in poverty had fallen to about 13 percent. At that point the percentage of the population living in poverty leveled off, and today it remains at about 13 percent.² Ironically, before the War on Poverty, there was a steady decline in the poverty rate. Since the War on Poverty began there has been virtually no decline in the percentage of

Americans who are living in poverty.

Economic Incentives and the War on Poverty

Before we ask why the war on poverty has not been able to bring the poverty rate down, we should consider why the poverty rate was declining so dramatically before the war on poverty began. The answer is economic growth, which presents economic opportunities to all citizens. If that is true, why has America's continued economic growth not pulled more people out of poverty? The answer is that the welfare system is unintentionally designed to give people an incentive to remain on welfare rather than work. Furthermore, the welfare system breaks up families, creating single-parent households that put children at a disadvantage, and perpetuating the cycle of welfare dependency from generation to generation.

While the intention of the war on poverty may have been to elevate poor people out of poverty, its actual effect has been to trap them in poverty and make it difficult for them to escape. The most comprehensive experiments done on the effect of welfare on the incentive to earn income, which were done by the U.S. Office of Economic Opportunity, found that for each dollar of welfare benefits, recipients reduced their labor earnings by 80 cents. In other words, welfare does not increase the incomes of low income individuals by any substantial amount. Instead, it substitutes government transfers for labor income.³

In debates about tax policy, it is common to focus on the disincentive effects of high marginal tax rates. President Bill Clinton's recently approved budget raised the tax rate on the highest-income taxpayers from 31 percent to 39.6 percent. Critics have rightly argued that the disincentive effects of the higher tax rate will offset any benefit that might be gained from higher revenues. If this is true, how would people react to a tax rate approaching 100 percent? It would take away all incentive to earn income.

This is exactly the situation faced by many who are on welfare. Depending upon the state, when all the benefits are added up, the welfare system will pay between \$8,500 and \$15,000 a year to a single mother, as long as she does not work, and as long as she does not marry an employed man. Consider the marginal tax rate implied by this system.

Assume that a welfare mother receiving benefits of \$10,000 per year finds a job paying \$7 an hour. Working full time will give her an income of \$14,000 per year. However, she no longer qualifies for welfare. Thus, for working 2000 hours during the year, she gets an additional \$4,000, which comes to \$2 an hour more than she can get on welfare. In effect, more than two-thirds of her income is taxed away. If she has to pay for child care, or has any work-related expenses (transportation to work, uniforms, etc.), she could actually lose money by taking a \$7 per hour job. Welfare recipients face the highest marginal tax rate of any Americans, and similar disincentives apply to both upper-income people and poor people. The welfare system taxes recipients at such a high rate that they are forced by the system to remain on welfare.

The same analysis applies if the welfare mother is considering marriage. If her potential husband has the \$7 per hour job, they can remain unmarried and have her \$10,000 in welfare benefits plus his \$14,000 income, for a total of \$24,000 in income. If they get married, their combined incomes fall to \$14,000 because she will no longer be eligible for welfare.⁴

Welfare and the Demise of the Two-Parent Household

The incentive structure of the welfare system has had a devastating effect on the traditional two-parent household. In the mid-1950s the out-of-wedlock birth rate among black Americans was about 20 percent. By 1989 it had risen to 65 percent. Lest we think that this has something to do with race, or with black culture, in Sweden, until recently the world's preeminent welfare state, the out-of-wedlock birth rate is 50 percent--well above the out-of-wedlock birth rate of American blacks in the 1950s.

Essentially the welfare state frees the mother of many of the burdens of single parenthood. In the absence of welfare, the potential single mother must consider who would take care of her child. Without a firm commitment from the father, parenthood would be a burden single mothers would want to avoid, but the welfare state lets the government take the place of the father--at least in some respects--greatly reducing the burden to the mother of having children out of wedlock.

Consider a poor, single, teenage woman in the 1950s with an out-of-wedlock child whom she cannot afford to care for. She generally had to look to her family for help, and if she was poor, this undoubtedly placed a large financial burden on her family. Because irresponsible behavior led to burdens on others in her group, there was a well-deserved stigma associated with single parenthood.

Today, because of government entitlement programs, if she has a child, she is entitled to have Uncle Sam support her and her child. Because the burden is taken off of her immediate family, the stigma is reduced to the point where it is now socially acceptable for women to bear children they cannot afford to care for. The government takes the place of the father, at least financially.

In 1960 for all Americans, births to unmarried mothers accounted for 5 percent of total births. In 1990 27 percent of births were to unmarried mothers.⁵ What is the matter with that? Murphy Brown thinks it's OK. Dan Quayle thinks it's a bad idea.

The Problem with Single-Parent Households

The first problem with single-parent households is that single parenthood leads to poverty. Approximately half of the single-parent households in the U.S. are below the poverty line; only 6 percent of two-parent households are. Low income is a problem in its own right--otherwise there would have been no reason to declare war on poverty--but the most significant problem is that study after study has shown that children who grow up in single-parent households fare worse than those who grow up in two-parent households.

The following table illustrates the striking differences in the poverty rates for single-parent and two-parent households.

Table 1. The Impact of Family and Education on the Poverty Rate
(Percentage Below Poverty Line by Category)

	Poverty Rate, 1991
All Families	11.5
Husband-wife families	6.0
Single-parent families	30.9
Female single-parent families	35.6
Single-parent families (with children under 18)	42.8
Female single-parent families (with children under 18)	47.1
<hr/>	
Education (persons 25-54)	
Completed high school	7.2
High school drop-outs	29.9
<hr/>	
Education and Family	
Husband-wife family (with children under 18; householder completed high school)	4.9
Female single-parent family (with children under 18; householder did not complete high school)	69.7

Source: U.S. Dept. of Commerce, Poverty Rate in the United States Table 4 and 11

Not only is the single-parent household a key factor in poverty, the incidence of such families has increased dramatically in the last three decades.

Consider the following facts about the children of single-parent families:

(1) More than half of the increase in child poverty is attributable to changes in family structure, according to a study done at Pennsylvania State University.⁶ Because it breaks up families, the welfare system actually pushes children into poverty.

(2) Children of single-parent households are more likely to be involved in criminal activity. More than 70 percent of juveniles in state reform institutions come from single-parent households. The effect of single-parent households is so strong that when studies control for the effect of single-parent households, there is no relationship between crime and race, or crime and income.

(3) Children of single-parent households perform less well in school, setting themselves up for a life of low income, and perpetuating the welfare cycle.

In summary, our welfare system promotes welfare dependency and causes poverty because it removes the incentive to work and to earn income, and it creates incentives to form and perpetuate single-parent households. The welfare system does not alleviate poverty, it creates poverty.

How Can the System be Reformed?

Nobody is happy with the way the welfare system is operating today. Hillary Rodham Clinton says, "I believe that personal responsibility is at the root of any kind of social structure, including the family. We have not done a good job in expecting people to exercise their rights responsibly and to be held accountable. There are cultural messages that undermine personal responsibility--widespread acceptance of what used to be considered inappropriate behavior, attitudes that allow people off the hook . . . Without addressing this and providing incentives to alter behavior and require

people to be more responsible, we're not going to get ahead of the curve on the serious problems--like disintegrating families, crime, and drugs--that afflict us."⁷ A substantial number of reforms have been suggested. Consider these two.

(1) In his address to Congress in January 1993, President Clinton proposed to limit welfare benefits to two years. After that, recipients would have to work to receive benefits. Individuals who, after two years on welfare, could not find private-sector jobs would be required to work in the public sector. President Clinton's proposal should be acted on immediately.

Some critics of this proposal have argued that it would increase the cost of welfare, because it would be more costly to provide public-sector jobs than just to give welfare recipients money. However, many recipients would no longer want to remain in the program if work were required. One study, examining the effects of a work requirement, showed that half of the welfare recipients who were required to work for AFDC benefits left the program and supported themselves. Thus, even if it cost \$10 an hour to provide a job paying \$5 per hour, the program would break even. There would be a program available as a "safety net" for those who needed it, but more important, the former recipients who left the program would be pushed into the mainstream of working Americans.

(2) Once a person has gone on welfare, no additional payments should be made for additional children. This would add substantially to the cost of having children for those people who cannot take care of the children they already have. It would force single mothers to be more accountable for the costs and consequences of their actions.

Children in families that continued to increase in size would be relatively poorer, but other children would benefit because they would not see an increase in their family size due to the incentives of the welfare system. The welfare system has had a devastating effect on children, as noted above, and eliminating additional welfare payments to welfare mothers who have additional children would, on net, be beneficial to children.

Entitlements Versus Charity

Before the advent of the welfare state, needy people relied on charity for help. Americans continue to be charitable people, especially considering the substantial welfare programs the government provides. Supporters of the welfare state argue that government assistance is desirable to provide a "safety net" for everyone, and that the inherent problem with charity is that there is no guarantee that it will be available when it is needed. Poor people, some say, should be entitled to government assistance. But this perceived problem with private charity is actually one of the benefits of relying on charity instead of government entitlements.

The term "entitlement" indicates that the recipient is entitled to the government aid, and this attitude can lure recipients into welfare dependence. A recipient of charity knows that the benefits come from the generosity of others, and will not continue unless the donors continue to view the recipient as deserving. Thus, recipients of charity have an incentive to support themselves and not leave themselves vulnerable in the event that there is a decline in the generosity of donors. The recipient of an entitlement, in contrast, has a right to the

payment, and the payment does not come from the generosity of the donor.⁸ Taxpayers are forced to contribute whether they want to or not.

Under this situation, there is no compelling reason for recipients to be eager to give up benefits that they have a right to receive. There is a reason for the recipient of an equal amount of charity to be eager to become self-supporting. By its very nature, an entitlement system robs the recipient of the incentive to become self-supporting.

Not only does the entitlement system sap the morale of the recipients, it is also demoralizing for those paying into the system. With charitable contributions, one is making a conscious effort and an explicit sacrifice to

help others, and donors can feel good about their altruistic inclinations. Nobody can feel good about paying taxes, however. Even if people agree wholeheartedly with the way the government spends their tax dollars, the government is forcing them to pay whether they want to or not. One cannot feel virtuous about being forced to do something. To add insult to injury, some critics argue that many taxpayers are not even paying their fair share.

Conclusion

If we use President Johnson's goals cited above to evaluate the War on Poverty after thirty years, we must conclude that we have lost the war on all counts. We have weakened the economy by placing a large burden on productive individuals to fund transfer programs. We have polarized the American polity by pushing welfare recipients farther from the American mainstream and creating a group of recipients that is entitled to live off of the tax payments of others. Those who already contribute the most to the system are told that they are not contributing enough.

Poor people in the U.S. are actually relatively well-off by world standards. In contrast to the starving citizens of Somalia, the most common nutritional problem of poor people in the United States is obesity. Poor people in the U.S. have more housing space per person than the average person in Western Europe. Nearly 40 percent of those defined as poor own their own homes.

Although the poor people in this country are relatively well-off by world standards, we would like for them to be better off. Unfortunately, our current welfare system is keeping them in poverty, not helping them out.¹⁴

NOTES

¹See Lawrence M. Mead, *The New Politics of Poverty: The Non-Working Poor in America*. (New York: Basic Books, 1992), for additional discussion.

²These figures are taken from Daniel J. Mitchell, "The Impact of Higher Taxes: More Spending, Economic Stagnation, Fewer Jobs, and Higher Deficits," Heritage Foundation Backgrounder #925 (February 10, 1993).

³See Robert Rector, "Requiem for the War on Poverty," *Policy Review* (Summer 1992), p. 42

⁴Rector, pp. 40-46.

⁵See Barbara Dafoe Whitehead, "Dan Quayle Was Right," *The Atlantic* (April 1993), pp. 47-84.

⁶Whitehead, p. 77.

⁷Quoted from *Parade Magazine*, April 11, 1993, p. 4.

⁸A reader of an earlier version of this *Backgrounder* who works for a private charitable organization told me that with increasing frequency, recipients of charity act as though they are entitled to charity, and become hostile when told that the organization does not have enough money to meet all of their requests for aid. This did not happen ten years ago, she told me. Thus, the entitlement mentality might now be extending itself to private charity.

The Mind/Brain Relation: I. Science and Metascience

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Interest in the relationship between mind and brain has become invigorated by the surge of activity in the neurosciences and in what has come to be called "cognitive science." The time is therefore ripe to take a new look at this age-old problem, but now from the standpoint of the scientist as well as from that of the philosopher. Today, we are in a position not only to reevaluate major philosophical stances but also to develop more limited and precise theories and models of mind/brain relationships that subsume a restricted database.

The surge of interest in mind/brain issues has come in various guises. Cognitive scientists have argued whether "representations" or "computations" characterize the relationship (see, e.g., Gardner, 1985; "Special Issue" in *The Behavioral and Brain Sciences*, 1980). A philosopher and a neuroscientist have banded together only to find themselves maintaining an interactive separateness of mind and brain (Popper & Eccles, 1977). And a neuroscientist (Sperry, 1952, 1969, 1976), as well as a philosopher (Searle, 1979) have declared themselves solidly on the side of mind (Sperry, 1980), whereas a psychologist (Skinner, 1971, 1976) has given up hope that a "science of mental life" as William James (1901), and more recently George Miller (1962), have dubbed it, is possible at all because such a science would depend on verbal communications, which are notoriously ambiguous.

It is this variety in the attempts to deal with mind/brain relations that calls forth my reevaluation. I know most of the protagonists personally and have high regard for all of them, as I have for much of the philosophical discourse that bears on the issues. It seems to me that these intelligent scholars cannot all be wrong despite the fact that their respective contributions are at variance with one another. Could it then be that they are all correct, in some nontrivial sense? If so, how?

My suggestion, to be developed here, is that each of these espoused philosophical positions has captured a part of the domain of issues and that what is necessary is to determine the database on which the position rests. The failure of philosophy to resolve the issues comes when a position is maintained beyond the confines of its relevant database to a point where another position is more appropriate.

The danger of such an eclectic approach is that one may end up with an "any worlds" or at least with a "many worlds" relativist viewpoint, which is fine if one wishes to show merely that there are many different answers to the questions posed. But I am not satisfied with such a result. I hope to be able to show that the several data based theoretical frames fit different agendas in philosophy and that a unified view can be constructed out of the diversity of theories.

I will provide one caveat: The approach taken here is new and must therefore of necessity be inadequate and even wrong

in detail. The important consideration is that the approach is a viable one and that it can be progressively sharpened by recourse to experimental disconfirmation (see Popper, 1968a, 1968b). The approach is essentially scientific but heeds the questions so carefully honed by philosophical inquiry.

The approach taken here leads to some apparent paradoxes: Dualism, pluralism, monism, constructivism, realism, and even idealism all find a place in the metaphysical scheme. Inferences from reaction time data, recordings of event-related brain potentials, and other results of experimental observations have led to the acceptance of the idea that cognitive operations are taking place in the brains of sensing and behaving organisms. As I hope to make clear, this epistemological acceptance leads to a pluralistic realism that is comfortable with dualism at the ordinary level experienced by behaving organisms.

In contrast, the reliance of cognitive science on computers and programs and of neuroscience on "information processing" interpretations, is constructivist and leads us close to idealism: an "informational" monism as seen from the identity vantage. Codes and transforms are shown to be the vehicles by means of which informational structures remain invariant over a variety of embodiments, a variety of realizations. Finally, an ontological neutral origin is shown to resolve the apparent paradox of invariance of informational structure and a plurality of realities. It is shown that to identify invariance solely as mental leads to awkward interpretations such as those that would hold that computers have "minds" and "feelings." Instead, a plausible case is made that what remains invariant across transformations is neutral to the mind/brain, mental/material duality and is captured by physicists' definitions of energy and the amount of its structure: entropy (interpreted as uncertainty), and its converse, negentropy (i.e., information). Such information can be realized mentally as well as materially, an idea captured by the aphorism that, on occasion, the pen can be mightier than the sword.

Metaphysics (Metascience)

Some Recent History

The story of current thinking on the mind/brain issue begins with Ernst Mach (1914) and the positivist approach. Mach was a dualist and a parallelist; mind and brain for him had identical structures but were forever separate entities. Mach's position gave rise to two major approaches, each centered on a particular problem. The first of these approaches accepted Mach's dualism but noted that mind and brain do interact, that is, influence each other. The question arose as to how that interaction might take place. Popper and Eccles (1977) answered this question by suggesting that mental processes create a World 3, composed of language and culture, that in turn feeds back, through the senses, to influence brain

mechanisms. Mind itself was noted to be an emergent of this interaction, an emergent immersed in the sensory (and motor) processes that relate the brain to the organism's environment.

The Vienna Circle, and especially Feigl (1960), addressed a different problem in Mach's formulation. If indeed identical structures characterize brain and mind what is it that is structurally identical? Feigl, in keeping with positivist tradition, focused on language and suggested that mind talk and brain talk were different aspects of some underlying Machian structure. In his identity theory, Feigl gave up dualism and opted for the monistic emphasis on basic structure.

Both Popper's and Feigl's programs have much merit, but each also poses new questions, questions that can lead to further insights. Just what is it that makes up World 3? What is the essence of language and culture that can so readily influence the brain? In the multiple aspects view, what is it that the aspects refer to? My answer to these questions is presented in scientific rather than philosophical terms. By this I mean that I am to identify the data set that each of the philosophic programs addresses rather than to push each program to its logical limit. The result of this approach is a neutral monism, neutral to the mind/brain duality, with the potential for multiple realizations. Feigl's linguistic dual aspects (e.g., mind talk and brain talk) are replaced by a plurality of realizations. A new duality is discovered: the duality between potential orders and their realizations.

Behavior and Experience

In contrast to philosophers, psychologists, under the banner of a realist radical behaviorism, eschewed any scientific reference to mind. As noted, the reasons for this are not arbitrary. Rather, as both Skinner (1971, 1976) and Quine (1960) have pointed out, the issue is that no two people mean exactly the same thing when they use a particular word or phrase. Furthermore, we can never be sure that even when we use a word such as green that it denotes the same experience to each person using it. But this is an issue common to all of science and indeed to all cognition, as Berkeley (1904) so persuasively argued. Are we therefore to give up, hang our heads, and sit in isolation in our respective existential corners? Of course not. Nor does it mean that in constructing a science we must exclude reference to our conscious experience. A common alternative is to make inferences and to proceed to deal with them. Cognitive science can and does proceed in just this fashion (see, e.g., Johnson-Laird & Johnson-Laird, 1983).

The issue is not just a philosophical one. When patients with occipital lobectomies say that they are blind even though they are able to respond correctly to the location and configuration of visual cues (Weiskrantz, 1974; Weiskrantz, Warrington, Sanders, & Marshall, 1974), how are we to deal with their "blind-sight" except to distinguish their instrumental responses from their verbal reports of introspection? A radical behaviorist would want to discount the introspective report as not "real"; in fact, several died-in-the-wool behaviorists have told me that they are certain that either the patients or the experimenters were lying. But this type of patient is not unique. Brenda Milner's (1966) famous subject, H.M., who had sustained a bilateral medial temporal lobe resection, has a similar difficulty: He cannot consciously remember Brenda even after

some 30 years of repeated testing while at the same time he performs perfectly in an operand situation that he learned many months before (Sidman, Stoddard, & Mohr, 1968).

The alternative is to ascertain to the best of our ability that we can accept at face value both the instrumental behavior and the verbal report and to go about the search for the neural mechanism that, when injured, can account for the dissociation. We accept the inference that the subject has a "mental life" that his or her psychological processes are accessible by way of his or her verbal reports and instrumental behaviors, and furthermore, that these different forms of behavior may reflect different processes.

Philosophers and psychologists of a nonbehaviorist persuasion may counter that any argument about mental phenomena derived from behavior is spurious. They would rather begin with "the phenomenon itself existentially experienced." But there is little that can be done with such experiences except to attempt to describe them (behaviorally) and to organize the descriptions (structurally). Thus, Maurice Merleau-Ponty (1963), an existentialist philosopher, has authored a book entitled *The Structure of Behavior*, which in both spirit and content shows remarkable resemblances to our own *Plans and the Structure of Behavior* (Miller, Galanter, & Pribram, 1960; see also Pribram, 1965), which tackles the issues from a behavioral and information-processing vantage. I do not mean to convey here that there is no distinction between a behavioristic and an existential-phenomenalistic approach to mind. Elsewhere I detail this distinction in terms of a search for causes by behaviorists and a search for informational structure reasonably (meaningfully) composed by phenomenologists (Pribram, 1979). What I do want to emphasize here is that both approaches lead to conceptualizations that cannot be classified readily as either mental or material. In their search for causes behaviorists rely on drives, incentives, reinforcers, and other "force-like" concepts that deliberately have a Newtonian ring. In their quest for understanding mental experience, existentialists come up with structure much as do anthropologists and linguists when they are tackling other complex organizations. And structural concepts are akin to those of modern physics where particles arise from the interactions and relationships among processes. The view to be developed here is that in neither case can this resultant of inquiry be characterized as mental or material unless one wishes simply to state a bias in favor of one or the other as being more meaningful to oneself.

Hierarchy, Reciprocal Causation, and Mind/Brain Identity

Let us look at this issue of structure in terms of computers, programs, and the processing of information in some detail because in many respects these artifacts so clearly portray some of the problems involved in the mind/brain issue. As has been repeatedly noted (see, e.g., Searle, 1984), the computer is not a brain, but its programs are constructed by people who do have brains. Nonetheless, computers and their programs provide a useful metaphor in the analysis of the mind/brain issue in which the distinction between brain, mind, and spirit can be seen as similar to the distinction between machine (hardware), low-level programs (e.g., operating systems), and high level

programs (e.g., word processing programs). Low level programs such as machine languages and assemblers are not only idiosyncratic to particular types of computer hardware, but there is also considerable similarity between the logic of these languages and the logic operations of the machines in which they operate. Thus, to some extent, perceptual processes can be expected to share some similarity to brain processes. On the other hand, high-level languages such as Fortran, Algol, and Pascal are more universal in their application, and there is less obvious similarity between their implicit logic and the logic of machines. At the highest level, in languages such as English, with which I address my computer in order to use it as a word processor, the relation between the logos of English (word, concept, logic) and that of the machine is still more remote. However, English relates me to a sizable chunk of the human social order. To complete the analogy, humanity's spiritual nature strives to make contact with more encompassing orders whether they be social, physical, cosmological, or symbolic.

Understanding how computer programs are composed helps to tease apart some of the issues involved in the "identity" approach in dealing with the mind/brain relationship. Because our introspections provide no apparent connection to the functions of the neural tissues that comprise the brain, it has not been easy to understand what theorists are talking about when they claim that mental and brain processes are identical. Now, because of the computer/program analogy, we can suggest that what is common to mental operations and the brain "wetware" in which the operation is realized, is some order that remains invariant across transformations. The terms information (in the brain and cognitive sciences) and structure (in linguistics and in music) are most commonly used to describe such identities across transformations.

Order invariance across transformations is not limited to computers and computer programming. In music we recognize a Beethoven sonata or a Berlioz symphony irrespective of whether it is presented to us as a score on sheets of paper, in a live concert, over our high fidelity music system, and even in our automobiles when distorted and muffled by noise and poor reproduction. The information (form within) and the structure (arrangement) is recognizable in many embodiments. The materials that make the embodiments possible differ considerably from each other, but these differences are not part of the essential property of the musical form. In this sense, the identity approach to the mind/brain relationship, despite the realism of its embodiments, partakes of Platonic universals, that is, ideal orderings that are liable to becoming flawed in their realization.

In the construction of computer languages (by humans) we gain insight into how information or structure is realized in a machine. The essence of biological as well as of computational hierarchies is that higher levels of organization take control over, as well as being controlled by, lower levels. Such reciprocal causation is ubiquitous in living systems: Thus, the level of tissue carbon dioxide not only controls the neural respiratory mechanism but is controlled by it. Discovered originally as a regulatory principle that maintains a constant environment, reciprocal causation is termed homeostasis.

Research over the past few decades has established that such (negative) feedback mechanisms are ubiquitous, involving sensory, motor, and all sorts of central processes. When feedback organizations are hooked up into parallel arrays, they become feedforward control mechanisms that operate much as do the words (of bit and byte length) in computer languages (Miller et al., 1960; Pribram, 1971a).

Equally important, programming allows an analysis to be made of the evolution of linguistic tools that relate the various levels of programming languages. Digital computers with binary logic require a low-level language (coded in the numerals 0 or 1) that sets a series of binary switches. At the next level, switch settings can be grouped so that the binary digits (bits) are converted into a more complex code consisting of bytes, each of which is given an alphanumeric label. Thus, for example, the switch setting 001 becomes 1, the setting 010 becomes 2, and the setting 100 becomes 4.

Given that 000 is 0, there are now eight possible combinations, each of which is an octal byte.

This process is repeated at the next level by grouping bytes into recognizable words. Thus 1734 becomes ADD; 2051 becomes SKIP, and so forth. In high-level languages, groups of words are integrated into whole routines that can be executed by one command.

It is likely that some type of hierarchical integration is involved in relating mental processes to the brain. Sensory mechanisms transduce patterns of physical energy into patterns of neural energy. Because sensory receptors such as the retina and the cochlea operate in an analog rather than a digital mode, the transduction is considerably more complex than the coding operations described above. Nonetheless, much of neurophysiological investigation is concerned with discovering the correspondence between the pattern of physical input and the pattern of neural response. As more complex inputs are considered, the issue becomes one of comparing the physically determined patterns with subjective experience (psychophysics) and recording the patterns of response of sensory stations in the brain.

These comparisons have shown that a number of transformations occur between sensory receptor surfaces and the brain cortex. These transformations are expressed mathematically as transfer functions. When the transfer functions reflect identical patterns at the input and output of a sensory station, the patterns are considered to be geometrically isomorphic (iso means same; morph means form), that is, of the same form. When the transfer functions are linear (i.e., superposable and invertible, reversible), the patterns are considered to be secondarily or algebraically isomorphic (Shepard & Chipman, 1970). Thus, as in the case of computer programming, levels of processing are recognized, each cascade in the level producing transformations that progressively alter the form of the pattern while maintaining intact some basic order, an informational structure.

In short, holding the identity "position" with regard to the mind/brain issue involves specifying what it is that remains identical. Unless something remains constant across all of the coding operations that convert English to binary machine code and back to English, my word processing procedures would not

work. Identity implies stepwise reciprocal causation among structural levels. Contrary to the usually held philosophical position, identity does not necessarily mean geometrical or even algebraic isomorphism. Transformations, coding operations, occur that hierarchically relate levels of complexity with one another. A level is defined by the fact that its description, that is, its code, is in some nontrivial sense more efficient (i.e., requires less work, less expenditure of energy) than use of the code of the components that compose it. In the case of the word processor, the coding is arbitrary and the arbitrariness is stored on a diskette and copyrighted. In the case of the mind/brain relationship, the nature of the coding operations is more universal and the efforts of a century and a half of psychophysical, neuropsychological, and cognitive research have provided knowledge concerning at least some of the coding operations involved.

I am belaboring these findings of scientific research to indicate that, contrary to what some philosophers hold (see, e.g., Dewan et al., 1976), they have relevance to philosophical issues. If the mind/brain problem arises from a distinction between the mental and the material and we find that at a certain level of analysis we no longer can clearly make such a separation, then the very assumptions upon which the issue is joined may be found wanting.

Within the framework of these considerations. Let us now look at some specific dualistic and mentalistic proposals that have been forwarded recently and place them within a perspective that states that the material/mental dichotomy holds only for the ordinary Euclidean-Newtonian world of appearances.

Do Experiences Matter or Does Matter Become Experienced?

In the ordinary world of appearances there is no question but that human mental experiencing can be distinguished

sharply from the contents of the experience. The issue has been labeled "intentionality" (or intentional inexistence) by Franz Clemens Brentano and has given rise to inferences about the nature of reality (Brentano, 1973; Chisholm, 1960). The question is often phrased: Is my phenomenal experience the "real" or does the content of those experiences make up the "real" world? My phenomenal experiences are mental; the world as it appears to me is material. I can give primacy to my experience and become a phenomenologist, or I can give primacy to the contents of the experience and become a materialist. But I can also give primacy to neither and attest to the dual nature of reality.

Materialism and phenomenology run into difficulty only when each attempts to deny the other. As long as only primacy is at stake, either view can be made consistent. After all, our experiences are primary, and empiricism is not inimical to a real material world. And we do appear to be experiencing something(s), so our experiences may well become organized by those real (material) somethings (see Bunge, 1980, for a persuasive development of this position).

However, by accepting such a moderate position with regard to mind and matter we immediately come up against a set of dualist problems. Are the contents of perception "really" organized by the experience of the perceiver? Is that experience in turn organized by brain function, sensory input, and the energies impinging on the senses? Would a complete description of brain function of an organism also be a description of the experience of that organism? If so, are not the material descriptions of brain, senses, and energies sufficient? Or at least do the descriptions of experience add anything to the material descriptions? Cannot the inverse be equally true? What do the descriptions of brain, senses, and energies materially add to what we so richly experience?

(References printed after Part III of "The Mind/Brain Relation")

The Philosophical Tradition That Modern Science Left Behind

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The upward trajectory of science, according to the conventional wisdom, hinges upon the depth, solidity, and durability of what is known as "basic research." The concept of basic research has served as a homing beacon in recent years for advocates of a partnership between the scientific academy and business enterprise. In the advocacy version of how scientific progress is nurtured and sustained, basic research drives the process of commercial innovation. New technological inventions and applications are the immediate outgrowth of breakthroughs in the more "fundamental" strata of scientific knowledge. An obvious illustration of this mechanism has been the revolutionary advances in the understanding of quantum mechanical effects within certain materials that led to the explosive growth of the semiconductor industry during the 1960's. A more up-to-date example would be the physics of wave phase conjugation, profile this past January in *Scientific American*. Such strides in the field of optics are likely to spawn a plethora of new military and communications devices, from ultra-sensitive signal processors to esoteric types of holography. Scientific "progress" in the concrete and practical sense demands constant attention to the larger conceptual and theoretical environments within which research is conducted and findings are validated. Although this elemental truth was not recognized for many years except in the scientific fraternity itself, the notion is generally accepted nowadays by politicians, economists, and entrepreneurs alike. It is one variant of the broader proposition that science does not, and cannot, comport itself in an intellectual desert. Scientific experimentation and development that lacks its own compelling work view is either trivial or fraudulent. The mounting social interest in the support of basic research attests to that realization.

The vagaries of basic research, on the other hand, cannot be explained in accordance with some notion of a stand-alone scientific venture. The objectives of scientific inquiry are not decided strictly by the priorities of the university faculty, the whims of the individual investigator, or the regnant fashions of the fraternity itself. The idea, popularized by Thomas Kuhn, that there is such a thing as "normal science" operating within the bounds of established "paradigms," which can change perhaps every hundred years or so, cannot be easily scanted. While the Kuhnian premise of recurring "paradigm shifts" has most likely been warmed over too many times, the suggestion that scientific work is always constrained by the authorized assumptions of its practitioners and does not by any means claim a universal scope of legitimacy can be readily shown in the stories throughout history of phenomena, such as meteorites, that have been dismissed as implausible conjectures. Kuhn's "revisionist" accounts of the history of science, like those of Michael Polanyi, have preferred the

invaluable lesson that scientific thinking is not only shaped by the subjective interests of its representatives, but is in a certain measure culturally conditioned.

At the same time, what has frequently been absent in contemporary discussions of the limiting factors in the scientific endeavor is a regard for the philosophical underpinnings of the field itself. The scholarly probes of E.A. Burtt into the close relationship between seventeenth century metaphysical speculation and Newtonian physics has set precedents for such a line of investigation. Yet the continuing indebtedness of scientific reasoning in the present, post-positivist age to philosophy has not gathered the notice it deserves. A fair portion of this neglect can be traced to the shrinking of this neglect can be traced to the shrinking of scientific attention, especially in America over the last fifty years, to the fractionated agenda of sponsored research itself. Just as philosophy under the tutelage of the late Medieval Church with its extensive apparatus for administering the *ordo salutis* degenerated into a calculus of moral and logical trifles detached from the ancient quest for wisdom, so the scientific enterprise under the aegis of government and academic bureaucracies has gradually become a labyrinth of special tasks and inquiries, often without a controlling focus. The dissociation of science from its own deeper intellectual roots has been responsible in part for the spread during this century of the popular cult of *scientism*, or what Juergen Habermas characterizes as "the conviction that we can no longer understand sciences as one form of possible knowledge, but rather must identify knowledge with science."

The assimilation of science to knowledge *per se*, which cannot be explained solely by the posture of scientific investigators themselves, is, however, a relatively recent innovation. Up through the nineteenth century what we now term "science" generally went by the name of *natural philosophy*, i.e., a "philosophical" examination of the phenomena of nature along with their causes. The use of such nomenclature is found in the work of Newton, who of course chartered the modern scientific undertaking. Newton regarded himself less as an empirical researcher in the current sense of the word than as a philosophical reformer. In the seventeenth century, when Newton lived, the primary debate was not so much between science and theology, as our schoolbook slant on history has urged us to conceive, as between what were known as "ancients" and "moderns." The ancients were the Greek philosophers, particularly Plato and Aristotle, with their tradition of explaining motion in terms of forms, substance, and what were termed quite tendentiously "occult qualities." The natural philosophy of the ancients, beginning with the pre-Socratic cosmologists and culminating in the Stoics, was in many respects a projection of Greek predicative discourse,

codified by Aristotle in the development of his logic. When Newton attacked so-called "hypotheses" as the bane of science, he was referring to metaphysical conjectures derived from syllogistic argument which commonly substituted in the minds of his scholastic counterparts for experimental evidence. Newton's stance was to offer his findings "as the mathematical principles of philosophy." Indeed, wrote Newton:

...the whole burden of philosophy seems to consist in this:

from the phenomena of motions to investigate the forces of nature, and then from these forces to demonstrate the other phenomena.

In other words, modern physics was born as an effort to **re-describe** the observable universe on a philosophically different footing than had been the case hitherto. P.F. Strawson's notion that traditional metaphysics has been of a "revisionary" character certainly obtains here. Nearly all of Newton's own writings are spiked with allusions to this attempt to change the very conceptual superstructure within which scientific labors had been circumscribed. In the opening section of the *Principia*, where the revolutionary equilibrations of force with matter and motion were put forth, Newton explicitly sought to bring a philosophical turn about in the history of Western thought, laying to rest the deductive rationalism of both the Schoolmen and the Cartesians while championing the cause of a strict phenomenalism. According to Newton,

...since the qualities of bodies are only known to us by experiment, we are to hold for universal all such as universally agree with experiments, such as are not liable to diminution can never be quite taken away. We are certainly not to relinquish evidence of experiments for the sake of dreams and vain fictions of our own devising...We in no other way know the extension of bodies than by our senses, nor do these reach it in all bodies; but because we perceive extension in all that are sensible, therefore we ascribe it universally to all others also...The extension, hardness, impenetrability, mobility, and inertia of the whole result from the extension, hardness, impenetrability, mobility and inertia of the parts...**And this is the foundation of all philosophy.**

Newton's "scientific" achievements, therefore, come closer to those of Descartes than our customary renderings in the history of ideas are likely to concede. Descartes was a metaphysician first and a scientific-mathematician more by derivation. The Cartesian *tour de force* was to turn the Scholastic method on its head by embedding scientific truth in a chain of inferences emanating from the mind's own self-reflection rather than propositions developed from Scripture and doctrinal authority. As Descartes wrote in the initial paragraphs of his *Meditations*: "I have always considered that two questions, namely those of God and the soul, are the foremost of all those that ought to be demonstrated by philosophy rather than by theology." Descartes' objective was simply to defend mathematics, or more precisely the "geometric method" of axiomization and demonstration, as a convenient alternative for metaphysical system-building to the protocols of religious dogmatics. Newton, in effect, carried Descartes' metaphysical insurrection one step further: the intelligibles required for philosophical analysis must not be

located in the transcendental domain of pure thought, but must be found in nature itself, if nature is in truth what "natural philosophy" seeks to cognize. Contrary once more to popular misconception, the Newtonian genesis of modern science did count so much as a harkening to Francis Bacon's call for observation through experiment as a final purging of Scholastic formalisms and conjectures (i.e., "hypotheses") from the new "mathematical mechanics." By the same consideration, Newtonian science has tightly wrapped up with the intense philosophical altercations of his day, which legislated for at least the next hundred years the framework within which experiment could proceed and suppositions tested. As Koyre notes, Newton's concepts of space and time, upon which his "law" of motion and acceleration were anchored, did not in any important sense follow from sense data constructions, but amounted to reasonable revisions of fundamental metaphysical tenets to support the theory of gravitation as well as action at a distance. In a similar vein, Newton was bent throughout his own efforts at philosophical renovation, in keeping with his staunchly Protestant beliefs, on preserving the necessity of a transmundane and all-sovereign Deity. Newton aside, it is apparent from an historical vantage point that modern science could only have evolved in the seventeenth century because of the weakening of the common superstitions concerning miracles, which was due not so much to the proliferation of more "scientific" or common sense accounts of natural anomalies as it was to the ascendancy of the Calvinist view that God operates everywhere in a consistent and orderly fashion, thus subordinating personal destiny to the regularities of the created universe.

By the nineteenth century the Newtonian "metaphysics of motion" had become so commonplace and so "unconscious", as it were, in the formulation of research strategy that its philosophical heritage was virtually forgotten. Even historians of science rarely ask today why the science of mechanics, as compared with say optics or biology, dominated and supplied the root metaphors for other modes of inquiry as late as the First World War. We can, to be sure, trundle out the well-worn reductivist premise that the ubiquity of steam-powered machines during the industrial revolution constrained the wider intellectual imagination; but the rationale is obviously far more subtle. One may consider Ernst Mach's introduction to his *Science of Mechanics* composed at the turn of the century, which holds forth with the philosophical advantages of the machine paradigm. "To find...what remains," asserted Mach, "in the phenomena of nature, to discover the elements thereof and the mode of their interconnection and interdependence - this is the business of physical science. It endeavors, by comprehensive and thorough description, to make the waiting for new experiences unnecessary; it seeks to save us the trouble of experimentation." Mach's assertion that mechanistic science makes experimentation unnecessary was far removed from Bacon's commendation of "experience duly ordered digested" as the fulcrum of natural philosophy three centuries earlier. But it was woven from the familiar assumption of his era that the mechanico-materialism nurtured since Newton's time had become, in effect, a powerful engine of deductive reason. Mach's suggestion that physical science had only to chart "what

remains" in the natural order reflected the widespread sentiment that the Newtonian world picture was all-inclusive and had merely to be filled out here and there in order to attain a total and sufficient description of things as they are. The Kuhnian principle, in other words, could not have been more in evidence. "Normal science" in Kuhn's phraseology had rigged the world up as a system of blocks and pulleys. And the self-confidence of the Machian outlook can only be explained in terms of the **philosophical** cogency of its explanatory model. If science in the nineteenth century was as much a metaphysical vision as it was an inductive discipline, it was that close relationship between the higher order reflections of philosophy and the concrete problematics of scientific inquiry which spurred creative advances. For example, the historical record shows that major discoveries during that such as the coupling of electricity and magnetism were motivated less by serendipity than by a philosophical passion on the part of certain scientific laborers for a unification of the chief aspects of nature. Han Christian Oersted's insistence that electromagnetic properties along with light and heat were manifestations of a single energy can be ascribed to the Romantic **Naturphilosophie** enunciated in such thinkers as Schelling and Hegel. The guiding idea behind the **Naturphilosophie** was that the various forces and phenomena of the universe were not self-limiting, but originated from a more profound and hidden source of change and action. It was the same unqualified drive that compelled Einstein to try to forge the fundamental physical dimensions, which he had so ingeniously redefined, into an integral set of concepts, the so-called "unified field theory." That drive, despite the absence of empirical confirmation during the decades following Einstein's death, still serves as the leading prospectus for theoretical physics today. It would probably not be stretching the point too far to say that nineteenth century scientific research, especially in Germany where the majority of breakthroughs occurred, exemplified Hegel's own statement that "all revolutions in the sciences no less than in world history, originate sole from the fact that Spirit, in order to understand and comprehend itself with a view to possessing itself, has changed its categories, comprehending itself more truly, more deeply, more intimately, and more in unity with itself." Because of the perdurance of the notion of science as "natural philosophy" in the German university curriculum well up into the twentieth century, the specific targets of research throughout that distinguished epoch could not be segregated

from the comprehensive tasks of philosophical idealism. Indeed, the dependence of German theoretical physics during the past hundred and fifty years on idealistic cosmology is well-documented. Einstein's conception of space-time as a four-dimensional "geometry" was heavily influenced, according to biographical data, by his reading of the seventeenth century Jewish philosopher Spinoza. Even the anti-idealism of the existentialist tradition had a measurable impact upon the formation of physical science. Niels Bohr's postulation of "discontinuity" in the quantum order of events was inspired by his meditations on the thought of the nineteenth century Danish philosopher Soren Kierkegaard.

What is ironic about the contemporary state of letters and learning is that so much avant-garde or "cutting edge" scientific research does not have its own self-generated pedigree, but has sprung forth from a heritage of scientific theorizing and speculation that is deeply engraved within the Western philosophical tradition. One, of course, may seek to adopt the long historical view and argue, as did Auguste Comte over a century ago, that empirical science has "outgrown" its philosophical cradle and is now quite capable of walking on its own. But we forget that Kuhn's "normal science" always develops within an ideological incubator that is textured and configured by the philosophical predilections of the given culture. Even the present day revolution in semiconductor technology is a consequence of the world-stirring breakthroughs in quantum mechanics that have been accumulating rapidly since the Second World War. But the advent of the quantum model of the universe, perhaps more than any scientific forward leap in the modern era, can be traced straight away to a new philosophical vision which rent asunder the older Newtonian picture of the world as "motions of permanent particles." Science may leave one generation of philosophy behind, but it must always be immersed anew, if perhaps only half-aware, in the philosophical baptistry. There can be no "basic research" without an attention to the **basic intellectual framework** within which hypotheses are forged and data scrutinized. Philosophy without science may be a jaded and wooly-headed game of the mind; but science without philosophy is but a chess match that has no wider strategy. The dire lesson can only be learned by an academic research establishment that slowly withers in the dry dust of inconsequence.

(Reprint *Contemporary Philosophy* Vol. XI, No.11)

Request for Papers

CRIME AND PUNISHMENT: NATURAL LAW, POSITIVE LAW AND NATIONAL/INTERNATIONAL MORAL NORMS

THE 1994 ANNUAL CONFERENCE
INSTITUTE FOR ADVANCED PHILOSOPHIC RESEARCH

Windcliff Condominiums/YMCA of the Rockies
Estes Park, Colorado
August 17-23, 1994

Suggested Topics:

-Crime Without Punishment

-Punishment Without Crime

-War Crimes/International Justice As A Special Case

-Terrorism and Counter terrorism

-Collective Responsibility - Are Nation States Moral Agents? If So, How Should They Be Punished?

-Deterrence: When Punishment Has a Purpose In International Affairs

-Sovereignty - Does It Have Limits? If So, How Are These Determined?

-Incarceration - What Is Its Purpose?

-Judicial Responsibility - What Do The Courts Owe To Society?

-Corporate Responsibility - Are Corporations Moral Agents? If So, How Should They Be Punished?

-Capital Punishment - Is It Ever Justified?

-Vigilantism And The Common Good - Can They Ever Coincide?

-Bias Crimes - Are They A Special Case?

Final Draft of Paper should be approximately 12 pages in length.

Presentation time: 20 minutes

Please submit a 1 to 2 page abstract of between 250-500 words by **June 30, 1994**.

To: Dr. Peter A. Redpath
Philosophy/Theology Division
St. John's University
300 Howard Avenue
Staten Island, New York 10306

Time Capsule: For the Realia Library

What current philosophical thoughts would you like to contribute to the Time Capsule of *Contemporary Philosophy*. Please submit either questions to pose or philosophical thoughts of 1 to 2 paragraphs. For example: How would the philosophical thought of assisted suicide today compare to 50 years from now?

General Editor

Founder's Corner

"Scientists have done their job, now it is up to the philosophers." -John Chancellor, NBC News

(From *Contemporary Philosophy*, Vol. XI, No.9):

What is the point of it all?

What is Philosophy all about? Once again, we have been brought up short by a few students' inquires. They had not yet learned enough. They indicated once again the necessity for responding to certain sophomoric questions, especially as they pertain to contemporary philosophy. Well, what is the contemporary philosophy enterprise all about? What should we philosophers be trying to accomplish? And why? In order to clarify the situation, it seems desirable to present an oversimplified question and answer series, to be seen as a backbone of what it is that we are all about. For time and space considerations, they will be short and to the point. Brief and concise. So, in simple layman's language:

What is philosophy not?

Is philosophy an academic discipline to teach students to become history of philosophy teachers, who will teach other students to become history of philosophy teachers, who will, in turn, teach other students, etc.? Is it merely mental or linguistic art? Is philosophy just a self-pleasing methodology for asking obtuse questions? Is it a device to convince others of how smart one is? Is it in order to get one-upmanship over others? Is philosophy for the private satisfaction of an esoteric in-group? Is wisdom and knowledge to be the personal possession of a select few? The answer to all of these is a flat "NO!" Though it may seem to be so by many people, philosophy should not be seen as any of

these. If it were, then we may as well write philosophy off as some extensive mental sport, played for its own sake, like chess or bridge. If not, then it would seem that we need a clearer understanding of what philosophy is all about.

What is philosophy?

It is only a word, but that word is assumed to stand for something. What is that? Philosophy is seen to be a universalized collective of abstractions and concepts, operating as a rational mental discipline, of fundamental questions and answers relating to man and the human condition, that have not been preempted by any other true knowledge discipline, and with certain inherent practical limitations and frontiers.

Who defines philosophy?

Well, what the word "philosophy" really stand for? And who says so? It has been said that each philosopher defines the word in his/her own way. Or that "philosophy" is that which philosophers do. Both may of course be true in certain limited senses. That is, each of us defines all words in our own unique way. However, the language belongs to society as a whole, and that society as a whole, has the ultimate right necessity to define the words in its language. The dictionaries justify their own existence by reporting the way that society uses its words universally. A general understanding prevails, and society as a whole defines what philosophy is-a universal term of and for all of humankind.

Letters to the Editors

Dear Editor:

What do philosophers think about the relationship between Hope
and Human Flourishing?

Gina M. Ruvido
University of San Diego

Dear Editor:

Do you suppose that you could persuade your Awards Editor to
establish an award for the best definition of Integrity?

The one that I am most familiar with is that:

Integrity is ones extreme obligation to oneself.
However I am not fully satisfied with it.

James A. Walker
Baltimore, Maryland

Contributor's Profile

Professor Deward E. Walker, of Anthropology and the Center for Study of Ethnicity and Race in America, scored tops in this category. Walker, an expert in contemporary Native American culture, has garnered respect from student, professors and members of the local Native American community for his service, said CSERA professor Evelyn Hu DeHart. "His reputation is national and, he's highly regarded in the Pacific Northwest, among tribes like the Nez Perce, for his service. He sees himself as an applied anthropologist, and believes it's required for scholars to take their knowledge back to communities, and put it at their disposal." In second place was Robert Pois of the History department. Pois, who specializes in European and German history, is a consummate lecturer who manages to make the often tragic and violent history of Germany a vibrant, and sometimes even humorous, adventure. Known for his quips, one-liners and unusual but effective analogies, one of Pois's statements stood out in the memory of at least one Daily staffer. Attempting to explain the impact of Napoleon Bonaparte upon the collective mind of Europeans, Pois once explained "The only person I can think of, by American standards, who had such a profound, charismatic impact on the culture, was (late Ohio State Football Coach) Woody Hayes." Other professors netting votes were Law School Man-of-the-West Water Expert Charles Wilkinson, and athlete-inventor-Harley rider-Engineer Igor Gamow. Congratulations, one and all, to these fine teachers.

Articles that may be of interest.
Contact your local library.

***Violence, Vandalism, Social Fragmentation
and Civilization***

by Prof. James J. Van Patten
Vol. XI, No. 8, Feb. 15, 1987

Proposals for Prison Reforms

by Prof. Theodore Klein
Vol. X, Nov. 2, March 1, 1984

Production, Consumption, and the Environment

by Lawrence B. DeSaulniers
Vol. XII, No. 10, July/Aug. 1989

***The Conflict Between Humanistic Values and
Environmental Realities***

by Prof. G. Ross Smith
Vol. VII, No. 3, Summer 1978

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