

Faith, Science and Sacramental Realism

Fr. Donald J. Keefe, SJ

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Author Biography

*Fr. Donald J. Keefe, SJ, former professor of Dogmatic Theology at St. Joseph's Seminary, Dunwoodie, New York from 1994-1996, was also a theologian in the Denver Archdiocese. Father Keefe has taught dogmatic theology at Canisius College in Buffalo, St. Louis University and Marquette University. After serving in the U.S. Navy in World War II, Father Keefe earned his J.D. at Georgetown University Law School before entering the Society of Jesus. He was a member of the Bar of the District of Columbia and of the State of New York. He has written several books on theology and theological method, notably, *Thomism and the Ontological Theology of Paul Tillich* and the two-volume work, *Covenantal Theology: The Eucharistic Order of History*. He is the author of more than 30 articles on dogmatic theology.*

Father Keefe, a member of the New York Province, is retired and lives at the Fordham Jesuit Community in New York City.

The following is a reprint of his paper presented at the October, 1991 ITEST Workshop, A Seminar with Father Stanley Jaki. Comments may be directed to Father Keefe at his e-mail address: dkeefe@fordham.edu



Institute for Theological Encounter with Science and Technology

Cardinal Rigali Center • 20 Archbishop May Drive • Suite 3400-A • St. Louis, Missouri 63119 • USA
314.792.7220 • www.faithscience.org • E-mail: mariannepost@archstl.org

ITEST has been concerned over the more than two [now three] decades of its existence with the interplay of Christianity, experimental science and technology. Insofar as memory serves, the emphasis of the ITEST conferences over those years has been rather upon the impact of technology on a Christian culture than on the classic issue of the relation of the knowledge which is the Christian faith to that which is had by way of experimental science. Apart from the confrontations of those persons who are committed to an evolutionary origin of the universe with those who are committed to its creation out of nothing, which have enlivened discussions of academic freedom over the recent past,¹ and apart from the disagreements developed over the past half century and more among physical cosmologists concerning the role of causality in physics, the faith-science relation has not in fact lately generated a great deal of discussion among scientists or theologians even on the informal level. — There are signal exceptions, however, to this disinterest; due very largely to the books, articles, lectures, and broad influence of Fr. Stanley Jaki, OSB, the long-suppressed discovery by Pierre Duhem of the medieval origins of the first of the laws of motion is becoming well known, while Fr. Jaki himself, who has long since achieved a world reputation at once as a Catholic theologian and a historian of science, has for many years been pointing out the indispensability for the physical sciences of the Jewish and Christian belief in the divine creation of the universe.

It would be impertinent in me to treat here of his work, given that he will be here to do so in person, and that the prospect of his presence among us during this Conference has drawn most of you to it. Instead, I wish to propose and to develop an ancillary viewpoint, one which owes more to a reading of Fr. Jaki's work than I can easily identify, but which also concentrates more particularly than does his work upon the pertinence of Catholic sacramental realism to the physical and specifically the experimental science.

I will argue that it is precisely this sacramental realism that permits the optimism which characterizes the experimental sciences, and which underlies their experimental mode. Such an assertion requires some considerable unpacking.

The physical sciences exist by their common refusal to permit any received or desired theoretical integration of experimental data to foreclose the continuing quest for the experimental verification of the theory in possession. The classic instances of this refusal to permit abstract theoretical constructs to triumph over historical fact include the discovery by Michelson and Morely in 1887 of the constant velocity of light, and by Max Planck in 1900 of the constant quantum of energy. These discoveries forced the transcendence of the Euclidian geometry and the Newtonian mechanics by Einstein's special and general theories of relativity, and by the wave or quantum mechanics developed for the most part by Planck, Bohr, Einstein, Schrödinger, Heisenberg, and Dirac. Since then, the quest for a unitary theory which might embrace relativity and quantum mechanics, somewhat as Maxwell's equations synthesized the classical physics of the middle third of the nineteenth century, has been unavailing. Recently, the interest in, or perhaps better, the fascination with fractals and the non-linear differential equations which describe them has again underwritten the incapacity of theory to comprehend the data disclosed by the experimental method of physics.

The resulting paradox is well illustrated by the notion, recently popularized, of a "science of chaos."² The paradox had been anticipated after a fashion by the disagreement, extending over more than fifty years, concerning the proper interpretation of quantum mechanics: on this point the tension between the determinist views of Einstein and the so-called Copenhagen interpretation of Heisenberg's uncertainty principle is still alive.

Recently our conferences have been enlivened by discussions of the implications of John Bell's experiments of some quarter century past, which on quantum mechanical grounds seem strictly to require that the notion of causality be dropped from the epistemology of physics. Fr. Jaki has written cogently to the refutation of this conclusion, and I shall leave it for him to address. My interest here is not directly in such issues, whose competent discussion require a training beyond that which is mine as a theologian; rather I wish to use them as illustrative of a dilemma common not only to physics, but also to theology, to law, to linguistics, to historiography, in brief, to all those fields of scholarly inquiry which traditionally rely upon historical experience, and which

employ theoretical constructs at once to unify the experimental data and to suggest the pertinence of further experimental inquiry.

The reliance of rational inquiry upon historical rather than ideal criteria is relatively novel in intellectual history; it is only in the Western world, in the cultures formed by the Judaeo-Christian religious tradition,³ that the experimental sciences have flourished by reason of that recourse to experimental verification of understanding. Fr. Jaki has written a great deal stressing the significance of the massive ten-volume study written by Pierre Duhem early in this century.⁴ The latter five volumes of this work, whose publication were delayed by an atheistic French academic establishment for nearly forty years, point out the anticipation of the first law of motion, which underlies all of experimental physics, by John Buridan, a fourteenth century scholar who taught for perhaps fifty years at the University of Paris. A nominalist who identified intellect and will, his name is better known from its association with a dilemma foisted on him by his adversaries, and known to philosophy as that of Buridan's Ass; you may recall that it finds an indecisive donkey starving to death between two equally attractive stacks of hay. But Buridan was better than that; his excogitation in the late Middle Ages of the notion of "impetus"⁵ had been forgotten for centuries when Duhem's magnificent historical scholarship recovered it.

Buridan had been driven to the derivation of this novel idea by the Judaeo-Christian postulate of a created universe whose diverse motions were also contingent and consequently had beginnings in time, instead of being inherent in materiality as such as Aristotelianism had supposed. Buridan's inference of a temporal beginning from the fact of the creation of the physical world placed him in this respect within the Augustinian camp, whose view of creation had been developed earlier by St. Bonaventure in the course of a controversy with St. Thomas.⁶ St. Thomas had defended the rational possibility of the creation of what amounts to an Aristotelian universe, one without a temporal beginning, in which motion is interpreted as an dynamism or appetitus necessarily intrinsic to material substance insofar as light or heavy. St. Thomas therefore denied that the contingency of creation required a beginning, and thus that it implied the particularity and contingency of motion and so of time.

But insofar as science is truly concerned for knowledge as novel, as the product of a learning from history, which is to say, insofar as it is concerned for experimental verification, the scientific inquiry presupposes a free coherence in the objective physical world.

In this thirteenth century controversy between the defenders of an Aristotelian quasi-animism and the Franciscan-Augustinian emphasis upon the novel implications of a truly contingent creation, there is remotely foreshadowed an undeveloped and unsuspected tension between the necessitarian rationality uncritically accepted by medieval Aristotelianism,⁷ and the doctrine of creation with its implication of the contingent substantiality of creation *ex nihilo*, and therefore of radically contingent truth. This tension is further latent, still obscured by an uncritical scholastic investment in Aristotelian logic, in the Scotist insistence against the Thomists, upon an noncategorical and therefore intuitive and free intelligibility immanent in the concrete singular thing or event (*haecceitas*), which Aristotelianism denied and which denial is implicit in some aspects of Thomism.⁸

This tension persists to our own time. On the one hand, there is effective in many academic disciplines, including physics and theology, the hardy conviction that whatever is objectively true can be shown to be necessarily true; on the other there is a common-sense, commonplace and communally lived commitment to a host of realities whose objectivity is vital to us, and which are very clearly free, neither necessary nor random.

This paradox pervades all scientific inquiry, which must be at once free and methodologically controlled. The freedom of such academic inquiry is more than academic, for it underlies the possibility of any learning whatever. It is too little remarked that this freedom of inquiry is not merely a personal immunity from constraint, a "freedom from": it is also at the same time, and far more significantly, a responsibility, a "freedom for" a truth which one's inquiry cannot control and which is therefore fascinating, intrinsically interesting because possessed of an inexhaustible because free intrinsic truth. The freedom of the inquiry cannot but connote a freedom

in the object, which presents itself to inquiry as continually novel, as finally and radically unpredictable, and so as continually interesting, for it is also responsive to the presupposition of all inquiry, that its object is coherent and intelligible independently of the knower; in the end, this requires as well that the intelligibility of the object of the inquiry be free, for it could not otherwise be known to be independent.

The question of the cause of an immanent and necessary intelligibility, i. e. , whether that cause be the immanent rationality of the mind, or the immanent rationality of the cosmos, is incapable of resolution and finally banal because falsely posed: it could make no difference whatsoever whether one's rationality were a mere participation in and submission to a universal logos, or in the alternative it were the autonomous imposition of an ideal order immanent to the mind upon an objectively meaningless chaos: no experiment could determine the issue. In either case, there would be no novel truth to discover, nothing to learn from historical experience, and no scientific inquiry could proceed.

But insofar as science is truly concerned for knowledge as novel, as the product of a learning from history, which is to say, insofar as it is concerned for experimental verification, the scientific inquiry presupposes a free coherence in the objective physical world. Because it presents itself as continually and always interesting, as always novel, always free, this free coherence can never be systematized, never reduced to formulae. Were that reduction to occur, it would show the object of inquiry not to have been free in the last analysis, and its intelligibility consequently to be no more than a reflex of the method of an inquiry discovered to be self-ruled and autonomous, submitted to no extrinsic criteria, rather than freely governed by a free object transcending the free inquiry as an answer transcends a question.

The debate occasioned by Einstein's refusal of the Copenhagen interpretation of quantum mechanics by which a methodological indeterminacy (the uncertainty principle) is projected upon reality to become ontological, provides an illustration of this impasse of a rationality self-enclosed within its own logic. Einstein preferred an unfree and determinate rationality "God does not play dice" to the objective disorder presupposed by the Copenhagen school's projection of the methodological indeterminacy principle of quantum mechanics upon the objective physical world.

While it is evident that from the merely random, nothing can be learned, it is perhaps less immediately evident that the random is supremely without interest, in the sense that it neither arouses nor can arouse curiosity. Of course, it can evoke the Faustian desire to impose order upon the putatively disordered: it is thus that much of modern science is no longer a *quaerens intellectum*, but a *quaerens potestatem* : a search not for understanding, but for power. However, Einstein's refusal of such chaos is itself also an a priori and ideal projection of a method governed by the Enlightenment postulate of autonomous and finally necessitarian rationality: he proposed no alternative to the Copenhagen school of quantum mechanics other than just such an impersonal and unfree rationality, reductively that of a pantheism.

But the physical sciences can afford neither limb of this *aut chaos aut determinismus* dilemma; either would suppress the possibility of experimental method. Oddly, this result seems to be accepted, even proclaimed, by the scientific community: e. g., the goal of physics is seen by many physicists to be a universally comprehensive theory which will make all further learning trivial.

One must then reject the foregoing rationalist dilemma---in which much of the contemporary discussion is locked---according to which one is forced to choose between reality conceived as a jungle, or as a cage. This puzzlement arises out of the supposition that an ideal nonhistorical method controls the discovery of truth in physics, which is in consequence itself ideal and nonhistorical. But, in order to continue to experiment, in order to continue to learn from the the experimental examination of the physical data of the concrete historical world, one must postulate that the significance of that world is historical and free rather than ideal and necessary.

However, when one refuses the fatalist presupposition underlying most of the contemporary physical cosmology, the question cannot but arise as to the ground, the source or cause of the free intelligibility of the objective physical order which any experimental curiosity not only takes for granted but apart from which it cannot be sustained. This intelligibility is clearly not derivable from the phenomena: such derivation, whether by induction or deduction, insofar as logical would not be free. Neither is that free intelligibility derivable from the immanent laws of human reason; insofar as such laws are discoverable and may be thought to be sufficient, they also must impose a priori a logical necessity upon the data, which again would negate their freedom and novelty. Further, the impossibility of such an autonomously coherent rational order has been established by the publication of Kurt Goedel's theorem some sixty years ago.¹⁰

But Goedel's proof of the impossibility of such autonomously coherent rationality does not establish the existence of an alternative free historical rationality. It is not at all obvious that, for all its indispensability to experimental learning, there is or can be a free order of reality. Neither is it easy to imagine what a free coherence might be, for in the first place, as free, it can have no a priori possibility; nonetheless, the imagination inevitably enters upon an attempt to discover such a prior possibility of freedom within the immanent possibilities of autonomous rationality. For illustration of this fatal flaw, need only recall the schoolboy debates over the reconciliation of divine omnipotence and human freedom, which invariably turn on schemes for the reduction of reality to necessity by establishing its prior possibility: the imagination simply cannot conceive of a creation *ex nihilo*, without any prior possibility; in fact, much of medieval thought resolutely denied its possibility while at the same time affirming it: witness St. Thomas' denial of any relation from the Creator God to his creation, despite his affirmation of the personal unity in Christ of humanity and divinity.

However, inasmuch as such efforts to rationalize freedom by its reduction to necessity are clearly futilities, we need not pursue them.

It remains that the greatest minds of the pagan world never so much as considered the possibility of a free truth, and philosophers of the Christian and post-Christian traditions seem to be in no better case in their own speculation, for over and again, they also return to the perennial pagan problematic, that of relating, under a heading of rational necessity, the indispensable unity of unity, goodness and truth, to the multiplicity and mutability of the physical world. This, the rationalized and dehistoricized problem of the one and the many or, otherwise put, of the unity of historical substance, defeated the highest reaches of pagan philosophy; neither Plato nor Aristotle resolved it. But that philosophical tradition accepted a priori the necessity of truth, while for the bi-millennial Western intellectual tradition, the pagan and determinist version of the perennial problem of the one and the many has been transposed and transvalued, however little this may be recognized by those who depend upon that tradition.

This transformation of that classic and permanent problem of metaphysics does not arise simply because its solution now must embrace a physical universe whose radius is some ten or fifteen billion light years; while that consideration enlarges its range of implication it does not change the nonhistorical character of the ancient philosophical dilemma. It is rather the very meaning of the problem of the one and the many that has been transformed by the postulate of the freedom of their relation, a postulate which is no more than a technical expression of the Judaeo-Christian tradition of the good creation. The objective truth of creation is historical, for the actuality (not the possibility) of free truth, of free reality and free objectivity that is the good creation must be historical, which is to say, given and received in a free event.

Historical truth is not an idea, not merely information. It is the free presence in history of an event of free historical synthesis of the one and the many, viz., of a free, objective, substantial reality, and it is appropriated personally and responsibly in a free historical praxis, which is always in a posture of worship. This historical truth is affirmed in the Jewish and Christian faith in the good creation, and is personally appropriated in the worship of the Lord of the covenant.

The autonomous reason cannot anticipate, without a turning away from its supposed autonomy, the historical actuality of a revelation of the good creation which is a concretely intelligible and free gift, a gift of truth that is historically ---which is to say, freely---and objectively immanent in the world by a presence which is also a free reception of the gift. Autonomous rationality can know nothing that is not immanently necessary; it cannot recognize a free gift of a free truth, i.e, a revelation, and retain its autonomy. Those who recognize the gift by and in the free acceptance and free affirmation of the revelation thereby have refused autonomy by accepting a truth they cannot control, which is criteriological for their own now free reality, their own free knowing, and consequently for their own historicity.

Once having been received, the revelation cannot be removed from history, whether one personally accepts the revelation or not. Consequently, it is not any longer possible simply to dismiss or ignore the Christian revelation of a free universe for, willy-nilly, we are all its intellectual debtors regardless of our attitude toward it. The notion of an objective freedom, a free historical objectivity which transcends all that the mind can reach without violating, but actually sustaining, the coherence and integrity of the mind's inquiry, has made its way, changing the human community politically, culturally and economically, and we have recently been witnesses to the irreversibility of that change. It is irreversible only because it is objective; even when that free objectivity is refused for some ersatz confection of autonomous thought, the objective reality remains as it was created, and as it has been revealed to be: free and to be freely and responsibly appropriated.

But in the scientific world, the world of learning, the change of the meaning of the one and the many, together with the affirmation of the freedom of their relation, is commonly resisted; for many in the scholarly world, freedom still savors of mere unqualified power, any multiplicity in which is simply irrational; the problem posed by such multiplicity as may surface in the academy is there ever and again resolved by theories which submit historical multiplicity and spontaneity to an ideal, a priori, nonhistorical and unfree monadic unity, whether of the physical world, the polity, the economy, or culture. From Plato to Marx to J. S. Mill, John Dewey, and the contemporary liberation theologians, this submission of history to eschaton then becomes the subject matter of a manipulative and universal education, intent upon inculcating the necessity of flight from all the horrors of a world which, were it free, must escape the salvific calculus of those who know.

Most of us have become familiar with this elitist atmosphere, paradoxically considered to be the very air of academic freedom, without much consideration of an alternative. Having been taught from our youth the conventional wisdom of the academy, of the knowledge elite, we have taken for granted the reality of at best a tension, of at worst a dichotomy amounting to contradiction, between faith in the revelation of a benevolent Creator and belief in "science," between the postulated vagaries of freedom and the postulated methodological determinacy of truth. The result of this commonplace conviction has been the effective quarantining of the scientific world, whose intellectual life is simply remote from that spirit which has shaped the free societies of the West, whose freedom is so attractive to those people whose range of responsibility has heretofore been con strained to the vanishing point by the utopian visions of the elitist establishment, the privileged nomenklatura, that was the Communist Party.

This removal of science and its practitioners from the historical concreteness of the free world has of late been becoming methodologically explicit. Less and less do the modern physical cosmologists deal with the universe of man; more and more they assume the role of the pagan divinity, who as wise is absolutely so, alien from and adverse to the historical world.¹¹ Yet once again, to assume this posture is to despair of learning from the world; it bespeaks the death of experimental science, and merits no further attention here.

It must be accepted that the experimental sciences are engaged with an inquiry into a truth which is objectively free; this means that science lives by a free commitment to the free order, the free resolution, of the One and the many in history, in the free physical world. This order is covenantal, the order of the historical good creation proclaimed by the Judaeo-Christian revelation, in which the authority of the One is supportive, not suppressive, of the responsibility and freedom of the many. The covenant is, concretely, the event of the revelation of the free

presence of the one God as Trinitarian, for only as Trinitarian, as the Father sending the Son to give the Spirit, is the covenant actual, and God freely present, irrevocably, in the human world, in human history.

The necessity of an intra-divine resolution of the problem of the one and the many if there is to be a resolution at all is manifest: autonomous reason can provide no relation between the absolute unity of being or of God and the mutability and multiplicity of the historical world. Any resolution of the problem, which is to say, any valid historical knowledge, any free analogous predication of being, any affirmation of concrete truth, must then be gift, a matter of freedom and so of revelation; only this can permit that analogy between unity and multiplicity which permits one to speak at all. Otherwise, all understanding is falsified by the standing contradiction between the absolute unity of the One, the Good, the True, and the fragmentation and diversity of being, truth and goodness in history. This isolation of the absolute and the historical is the sum of pagan melancholy. If it be conceded that a resolution of this dichotomy must be a matter of revelation, it cannot be so as mere information, which could only be intrinsically contradictory; rather, the One-many relation must be historical, an event, not merely a word.

The Franciscan mediators of the Augustinian theological tradition have long since recognized the grounding of creation (the concrete One-many relation) in Christ's revelation of the Triune God: only if within God unity and relativity are reconciled can a good creation be intelligible. Briefly, the divine Unity, as Trinity (the Father sending the Son to give the Spirit) is freely, which is to say covenantally, related to the good creation; God is then revealed to be absolute not in the rationalized and monadic sense ordinarily associated with that term by Neoplatonizing theologians.¹² The revelation that the Unity of God is Trinitarian then permits a re-understanding of unity across the board: e.g., the human substantial unity is then also tri-relational: it is the marital imaging of the Trinity. This unity is at once free and holy, for it is actual only as worship.

It is then not too much to suppose that the unity, truth and goodness of the entire creation is of this order: continually new, continually revelatory of God, in short, sacramental,¹³ and that this unity is present in the world in freedom, not by the sort of imposition of God on the historical world exemplified, for example, by the mythical accounts of the amours of Zeus, but by their Christian conversion, the historical narrative of the covenantal fiat of the Theotokos. But that the revelation of the Trinity suffices for the needs of scientific inquiry is not immediately obvious; insofar as such inquiry depends upon a free creation, it would appear that the freedom which is grounded in religious commitment is merely subjective, a matter private to the believer and even if capable of a public appropriation, yet incapable of grounding the free objectivity of the world of our daily encounter. Is one really to suppose, on the basis of the presumed truth of the Christian revelation, that the sticks and stones and quarks of the physical universe are immanently free? Does not this do violence to the language itself?

We have come of late to recognize, albeit obscurely, that some such dignity as an immanent and utterly unique and irreplaceable truth, goodness and beauty does attach to each of the elements of our world. The ecological movement is not without its aberrations, but its instincts are sound, for they presuppose that the world is good, and that all the living things which inhabit it (fetuses apart, some would say) have a unique worth which we are bound to respect; it supposes that the material resources of the world, animate and inanimate, are not mere objects, but that in some way they evoke our respect. We should not waste the mines nor lay waste the forests and the fields nor poison the air and the earth, nor drain sewage into the rivers and lakes, and there is more in this conviction than mere aesthetics, for these are not merely private matters *de gustibus*, but rather are testimony to a public morality, a public responsibility for a common world, whose objectivity cannot be that of an object merely, for it evokes our responsibility.¹⁴

But must one not suppose, with all of liberal theology, that whatever is given in history grows old, and becomes finally inaccessible? Is it not axiomatic that time is the devourer of all things, and have we not long since grown accustomed to the supposition that a devoutly historicist historical criticism has the last word in exegesis, in church historical studies, and in theology generally? The standard illustration of such truism is the liberal isolation of "the Jesus of history" from the "Christ of faith:" the historical-critical method of modern theology

has rendered the former unavailable, the latter ineffable. How then to speak of the historical mediation of the Judaeo-Christian revelation of the Lord of the Covenant? This problem once was proper to Protestantism; it is now accepted as their own by the bulk of Catholic theologians, who are by that acceptance involved in what is for the Catholic tradition a false problem, one that does not, nor can, arise within the Catholic faith in the Lord of history, for within Catholicism that Lordship is exercised sacramentally, finally Eucharistically.

Most theologians of whatever confessional allegiance are familiar with the St. Thomas' theological account of the Eucharistic presence of the risen Christ. He describes it as a presence *per modum substantiae*, which is to say that this presence is achieved not by the accidental empirical manifestations of temporal and spatial location (e. g., moving the consecrated species does not move the risen Christ) but that nonetheless it is really achieved, because achieved not accidentally but substantially, by the signing of the accidents of the consecrated bread and wine, which cause to be present, non-empirically, non-accidentally, the risen and sacrificed Lord. Without entering into the matter of the adequacy of the Thomas metaphysics for the task to which they were put, it is sufficient here to observe that St. Thomas' theology of the Eucharist is loyal to and is governed by the liturgical and doctrinal tradition, which he attempts to account for in terms of his metaphysics of substance and accident. He is then a witness to the Catholic liturgical tradition, and an uncommonly clear one. The affirmation that Jesus is the Lord, and the "This is my Body, this is my Blood" of the Eucharist are strictly linked in that tradition, for Christ is present to history as the Lord of history, which is to say, it is by the Eucharistic sacrifice that he is in our fallen history as the Lord, the Redeemer, transcending and giving it that significance by which history is known to be salvific, and no longer to be understood as the sorrowful wheel of Mediterranean and Indian paganism. As Lord of history, the Son sent by the Father to give the Spirit, he makes all things new; immune to the erosion and negations of fallen history, he relates, orders, its past and its present to the event of its consummation in the Kingdom of God, a consummation which is the center of history, its ordering and salvific cause, the One Sacrifice by which we are redeemed by the free appropriation, in worship, of that history as our own. The pagans mourned that time devours its children; we rejoice that the Lord of history redeems them.

This celebratory Christian knowledge, this historical faith, this optimism, is more than piety, more than personal faith, more than an idiosyncratic dogma arbitrarily imposed, for it asserts that the objective truth of the world and of humanity is free, because it is given us in Christ. The Catholic faith in Christ is then the free, public response to and the appropriation, at once personal and communal, of the free revelation of the factual, the objective order of reality, to which we have access only by a freedom which is equivalent to worship; the covenantal worship of the Lord of the covenant, the Lord of the history which the covenant in his Blood redeems and orders to our salvation. Only by the praxis of that free commitment do we have access to objectivity. To affirm this is to turn the conventional wisdom on its head, and yet that affirmation alone can underwrite the historical optimism of experimental science.

1. The understanding sought by the kind of scientific inquiry implicit in, e.g., modern physics does not bear upon the phenomenal order; it seeks an explanation of the phenomena which transcends them while saving them.
2. This understanding cannot be given a coherent ideal expression: Goedel's proof of the impossibility of a non-trivial immanently coherent mathematical construct or theory shattered that ambition sixty years ago.
3. The sole alternative to the impossible ideal mathematization of the empirical world is the subordination of the mathematical summation of data to continual historical verification, as a question remains a question by its subordination to an answer, in such wise that the one is never confused with the other. This confusion is inevitable unless neither the question and the answer are ideal: both must be historical, free rather than mere necessary implications of an autonomous rationality.

We have seen that the experimental sciences which are the glory of our secular civilization require such an order, such a concrete free intelligibility in history. The question before us is whether there is any other basis upon which its reality may be grounded than that which Catholic sacramental realism provides.

The credibility of an affirmation that there is some other basis requires that it be set out. I think that this has never been done. Perhaps the most perceptive non-Catholic writer on this subject is Thomas F. Torrance of the University of Edinburgh, whose most recent entry into the topic, *The Christian Frame of Mind*,¹⁵ is, if I may quote my recent book, an admirable and insightful attempt to find an integrating principle of order which would so unify the inquiries of the physical sciences and of theology as to make them both expressions of a *fides quaerens intellectum*. Having explicitly rejected Eucharistic realism (at p. 31) Torrance recognizes that there must be found within the order that is created in Christ a free event which grounds this free order of intelligibility (at p. 79)---but having banished sacramental (nonempirical) realism from his consideration, he can provide no ground which does not, qua empirical and therefore time-bound, ineluctably vanish into the past, posing then the dilemma he would resolve: either the principle is ideal, which cannot serve his purpose, or it is historical, and because he has not seen that history is a theological category, the event as historical must be turned over, not to free appropriation by faith, but to the historical academy in the manner of Lonergan's surrender of the historical tradition of the Church to "philology," or the event is one of a purely private subjectivity, and again cannot serve his purpose, for the faith's *quaerens intellectum* is public, because ecclesial. Torrance's insight into the problem of the free historicity of the epistemology of the physical sciences and of theology is exact as well as brilliantly set out and illustrated, but without the Eucharistic immanence of the New Covenant no solution to the dilemma set by historical inquiry, whether scientific or theological, is possible.¹⁶

With this comment we may come to an end. The propositions before you are simple enough, and sufficiently developed for their discussion:

- (1) The experimental method of the sciences requires a free historical objectivity.
- (2) There is no free, intelligible, objective order in history other than that which is covenantal and Eucharistic.

The consequence of these propositions is also simple:

- (3) The objectivity of the experimental criteriology inherent in the scientific method, insofar as experimental and therefore historical, is sacramental and radically is Eucharistic.
- (4) In sum, the world of experimental science is open to our inquiry only because it is objectively holy.

ENDNOTES

. For a current instance, see the exchange between the author, Eric Lerner, and a reviewer of a recent work, *The Big Bang Never Happened: A Startling Refutation of the Dominant Theory of the Origin of the Universe* (New York: Random House, 1990), in the *New York Times Book Review*, Sept. 1, 1991, p. 4.

. James Gleick, *Chaos: Making a New Science* (New York: Penguin Books, 1987).

. The term "Judaeo-Christian" is employed, rather than simply "Christian" or "Catholic," not to enlist Jews and Protestants into the Roman Catholic liturgical/doctrinal tradition, but to stress that the dividing line, conversion to a free truth, a free objectivity, is the revelation of the One God of the Covenant.

. *Système du monde: Histoire des doctrines cosmologiques* (Paris: A. Hermann, 1913-1959) I: La cosmologie hellénique <(1913). II: La cosmologie hellénique (suite). L'astronomie latine au Moyen Age (1914). III: L'astronomie latine au Moyen Age (suite; 1915). IV: L'astronomie latine au Moyen Age (suite). La crue de l'aristotélisme (1916). V: La crue de l'aristotélisme (suite; 1917). VI: Le reflux de l'aristotélisme; les condamnations de 1277 (1954). VII-IX: La physique parisienne au XIVe siècle (1957-1958). X: La cosmologie du XVe siècle; écoles et universités au XVe siècle (1959).

. It had been supposed by the Aristotelianism of the day that a body in motion was sustained in it by the ac-

tion (antiperistasis) of the surrounding medium, in the sense that a projectile such as an arrow would be at once drawn and pushed forward by the air through which it passed. By “impetus” Buridan understood a force imparted by the mover to the moved, proportional to the speed and mass of the object moved. The concept of impetus invited the measurement of the force by experimental means.

. Cyril Vollert, S.J., Lottie Kendzierski, and Paul Byrne, eds., *St. Thomas, Siger of Brabant and St. Bonaventure On the Eternity of the World (De aeternitate mundi)*; trans. with an introduction (Milwaukee: Marquette University Press, 1964).

. Aristotelianism is commonly said to have been “received” in the Latin West during the thirteenth century. This is certainly true with respect to the bulk of Aristotle’s writing, but the impact of Aristotle’s logical works had been felt in the West much earlier, first by way of the Neoplatonic “old logic” of Boethius and Porphyry, then as “dialectic” or “new logic” during the Carolingian and early medieval Eucharistic controversies, and finally through the Neoplatonizing interpretations of Aristotelian metaphysics by Moslem and Jewish scholars whose translations into Latin in the thirteenth century restored the profound link, long forgotten, between the familiar Aristotelian logic and the unfamiliar Aristotelian metaphysical analysis of the immanent intelligibility of substance in terms of its necessary intrinsic causes; on this see David Knowles, O.S.B., *The Evolution of Medieval Thought* (New York: Random House, A Vintage Book, 1962). The threat of this rationalization of metaphysics, through its reduction to intrinsically necessary causes, to the historical realism of the Christian faith was recognized by St. Thomas in his controversies with the Averroists such as Siger of Brabant; it also fueled the resistance of such Franciscan theologians as John Peckham to the Aristotelian analysis exemplified above all others by St. Thomas. St. Thomas’ own conversion of the metaphysical analysis to the doctrine of creation may be seen to have been flawed by the same determinist presuppositions he criticized in the Averroists: while the contingency of creation entered into his metaphysical analysis of created substance at the level of existence-essence, it did not enter into the equally substantial form-matter and accident-substance analyses. This mistake permitted him to deny contingency (beginning) in the matter of temporal duration as controlled by his still-determinist form-matter and accident-substance analyses.

. For instance, the Thomist moral theology rests upon an abstract definition of human nature as rational animality, ignoring the masculine-feminine polarity, and intends to ground the historical morality of the Ten Commandments on that definition. A considerable amount of ink is currently spilled over the resulting problem of monism vs. dualism in anthropology: e.g., the Catholic Biblical Association Report of its Task Force on the Ordination of Women, “Women and The Priestly Ministry: The New Testament Evidence,” *Catholic Biblical Quarterly* 41 (1979) 608-613, 616, reprinted as “C.P.A.. Task Force Report: Women in the Church,” *Origins* 9 (1979) 450-454, and the Catholic Theological Society of America Task Force Report on the Ordination of Women, *C.G.S.. Proceedings* 33 (1978) 271-272; reprinted as “The Ordination of Women,” *Origins* 8 (1978) 86-88.

. Sheldon Lee Glashow provides a particularly clear expression of this odd ambition in “Toward a Unified Theory of Physics,” *Michigan Quarterly Review* 23 (Spring, 1984).

. Ernest Nagel and James R. Newman, *Gödel’s Proof* (New York: New York University Press, 1958).

. In many of his more recent books and articles, Stanley Jaki has pointed to this scientific hubris, which presumes an ability to construct a universe, or an infinity of universes, on grounds which evoke a passage from FitzGerald’s *Rubiyat*:

. And fear not lest Existence closing your
. Account and mine should know the like no more;
. The eternal S...ki from that Bowl has poured
. Millions of Bubbles like us, and will pour.

. *The Rubiyat of Omar Khyam*. Translated into English by Edward FitzGerald. A complete reprint of the First Edition and the combined Third, Fourth and Fifth Editions, with an Appendix containing FitzGerald’s Prefaces and Notes. Edited with an Introduction by Louis Untermeyer (New York: Random House, 1947) at 79.

. H. U. von Balthasar, *Clerical Styles*, 329, citing Bonaventure’s observation (*Hexaameron* 1, 12-13 (V 331ab)):

Christologus verus metaphysicus.”

. A sacrament is a work of the risen Christ, in which the salvation effected by his One Sacrifice is mediated to those for whom he died by a sign whose efficacy does not depend upon men but upon him. The central sacrament is the Eucharist; the others (e.g., baptism) are directed to it as aspects of the Eucharistic worship of the risen Lord.

. This theme is especially the subject of Hans Urs von Balthasar’s work, *The God Question and Modern Man*; trans. Hilda Graef; foreword by John Macquarrie (New York: Seabury Press, 1967).

. Thomas F. Torrance, *The Christian Frame of Mind: Reason, Order and Openness in Theology and Natural Science* (Colorado Springs: Helmers and Howard, 1989).

. *Covenantal Theology II* (Lanham, MD: University Press of America, 1991), at 142.