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# After Lakatos

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**Abstract** *The work of the philosopher of science Imre Lakatos has been highly influential upon scholars of science and religion, especially persons who want to demonstrate how theological inquiry may meet the intellectual standards of science. I first argue against Lakatos' position, showing how it fails to meet its own ambitions of providing clear and public criteria for assessing scientific theories. I then argue that the same weaknesses will manifest themselves in the work of his followers, using Nancey Murphy's early work as an example. I conclude by affirming Murphy's recent shift towards Alasdair MacIntyre's theory of rationality.*

**Key words:** Imre Lakatos; Alasdair MacIntyre; Nancey Murphy; Scientific theory



In a recent set of articles in the journal *Zygon* on Robert Russell's book *Cosmology: From Alpha to Omega*, Russell and Nancey Murphy discuss the merits and drawbacks of the philosophy of science of Imre Lakatos.[1] Murphy attempts to persuade Russell that Alasdair MacIntyre's account of rationality has superseded Lakatos' as the most sophisticated one available. Russell, who says he was converted to Lakatos' philosophy by Murphy's early works and employs Lakatosian arguments in the *Cosmology* book, asks whether it really fails in the way Murphy suggests.[2] Though Russell generally seems receptive to Murphy's arguments, she confesses that her promotion of MacIntyre's work "often leaves my audiences unimpressed."[3]

My purpose in this article is to assist Murphy in illustrating the deficiencies of Lakatosian philosophy of science. Drawing upon the writings of Lakatos and Murphy's earlier endorsement of him, I will show that Lakatosian philosophy of science has more weaknesses than even Murphy has identified. I conclude by briefly showing how MacIntyre sidesteps these problems, agreeing with Murphy that his account is a superior option.

## Between Popper and Kuhn

Russell is not alone in his esteem for Lakatosian philosophy. Perhaps scholars of science and religion have appropriated no other philosopher of science more than Imre Lakatos. Numerous books and articles have been written over the past few

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decades employing a Lakatosian perspective, in particular using his work to show how theological scholarship can exhibit the same characteristics of rational inquiry that science does.[4] If theological theories can meet the exacting standards of contemporary philosophy of science, it is suggested, then the wider public should take them seriously.

The attractiveness of Lakatos' position is that it seems to offer a synthesis of the best aspects of the philosophy of Karl Popper and Thomas Kuhn. For Popper, the key characteristic that demarcates science from other forms of inquiry is the ability to clearly and publically evaluate scientific statements, such as Einstein's prediction that light waves bend in a gravitational field. Thomas Kuhn disagreed with Popper on two central issues: the prevalence of crucial experiments and whether scientific knowledge is cumulative. Scientists do not normally try to refute paradigms, for the scientist's belief in the paradigm is a precondition for research. Moreover, scientific knowledge is not straightforwardly cumulative for Kuhn because facts depend on evaluative criteria that are internal to a paradigm. Rival paradigms are thus incommensurable because there is no neutral way to settle disputes, making the history of science into a series of dramatic revolutions rather than linear growth.

Lakatos found Kuhn's objections to be persuasive, but Lakatos could not fully embrace Kuhn's philosophy. Without super-paradigmatic standards for deciding between scientific theories, Lakatos thought Kuhn made all theory change in science to be ''irrational, a matter for mob psychology.''[5] Lakatos found Kuhn's argument against rational standards for theory comparison to be dangerous, for it represented scientists as not unlike the citizens of repressive political regimes of Eastern Europe. If successful scientists need to be brainwashed into perceiving the world from a particular viewpoint, then why object to censorship in the political realm?[6] As someone who had experienced first-hand the propaganda of Nazi and communist Hungary, viewing science in this way was abhorrent. The goal of Lakatos' philosophy of science, as a result, was to split the difference between the two philosophers by emulating the historical sensitivity of Kuhn's work while retaining Popper's commitment to some form of rationalism.

## Methodology of scientific research programs

I will review the basic features of Lakatos' philosophy here, not only to orient unfamiliar readers to his work, but also to draw attention to features that are not often discussed by his advocates in field of science and religion. The first major change in Lakatos' approach compared to Popper is that science is not concerned with refuting individual theories but entire research programs. Research programs are defined as a group of theories, where some form a ''hard core'' of unrevisable principles and other theories are the ''protective belt'' of auxiliary assumptions that surround the hard core and may be revised whenever necessary to protect the research program from falsification.[7] By redefining the falsificationist program in terms of research programs, Lakatos overcomes both of Kuhn's major criticisms against Popper. Falsification in science is not a duel between observation and

theory for Lakatos because it is never clear which of the many auxiliary theories should be revised in light of contradictory observations. A scientist is free to alter whatever auxiliary hypothesis he or she thinks is necessary to overcome the anomaly. Furthermore, crucial experiments are not an important part of scientific activity or history because it is impossible to test a particular theory against a particular observation.

An important part of Lakatosian research programs is their ''heuristic'' value, which refers to the guidance that research programs give to scientists engaged in research. Research programs have a ''negative heuristic'' that tells scientists to modify auxiliary hypotheses in order to defend the central hypotheses that form the hard core. Research programs also contain a ''positive heuristic'' that ''defines problems, outlines the construction of a belt of auxiliary hypotheses, foresees anomalies and turns them victoriously into examples, all according to a preconceived plan.''[8] Lakatos' positive heuristic is similar to Kuhn's notion of puzzle solving; just as Kuhn describes the scientist's task as applying a paradigmatic solution to new situations, Lakatos says the heuristic of a research program will suggest certain research paths. The positive heuristic motivates scientific research in spite of known refutations within the program and protects young programs in competition with more established rivals.

Having conceded to Kuhn the point about theory-laden interpretations, Lakatos still hopes to retain objective reasons for preferring some theories to others by injecting ''some hard Popperian elements'' into the appraisal of research programs.[9] Lakatos argues that a research program is ''theoretically progressive'' if changes in its auxiliary assumptions continually produce novel predictions. When Isaac Newton was developing his theory of the solar system, for example, it was theoretically progressing because its modifications were in line with the program's heuristic, even though none of the early models was empirically adequate.[10] If some novel predictions are confirmed, then the program is ''empirically progressive'' as well. Thus, Lakatos differs from Popper by saying it is perfectly appropriate for scientists to ignore the anomalies within their theory, so long as there continue to be new predictions or as conceptual problems are being solved in light of the heuristic.

Putting the theoretical and empirical metrics together, Lakatos says that a research program is progressing as long as its theoretical growth anticipates its empirical growth, meaning it keeps predicting novel facts. A program is degenerating if its theoretical growth lags behind its empirical growth, meaning it only offers after-the-fact, or *post-hoc*, explanations of discoveries found by rival programs or by chance.[11] Nevertheless, it is simplistic and wrong to discard a program as soon as it starts to degenerate. Lakatos repeatedly stresses that there is no such thing as ''instant rationality'' and says that a research program only needs to produce new facts ''intermittently,'' because many stagnant scientific theories in the history of science were later rehabilitated and became widely accepted. One should only claim that a research program is the most rational if it has consistently progressed for a significant period of time over its rival. Evaluating competing theories should not be rushed because programs must be given time to develop, and the novelty of a predicted fact can only be seen after a long period of time.[12]

Lakatos summarizes his position this way; ''The main difference from Popper's original version is, I think, that in my conception criticism does not—and must not—kill as fast as Popper imagined ... *Criticism of a programme is a long and often frustrating process and one must treat budding programmes leniently.*''[13]

## Lakatos and the history of science

Lakatos recognizes that after Kuhn's *The Structure of Scientific Revolutions*, it was not possible to maintain a conception of scientific rationality that was at such odds with actual scientific practice.[14] Lakatos thus proposes a ''historical method'' for the evaluation of rival methodologies, where methodologies function as historiographical theories that can be tested and evaluated.[15] The testing of these theories against history, however, is far from straightforward because they, like scientific methodologies, are awash in a sea of anomalies. No theory of rationality can accommodate all of the history of science. He argues that we should evaluate historiographical theories like scientific research programs, where theories are not falsified but, instead, abandoned in favor of theories that can explain a broader range of historical facts. Historical anomalies are problematic for theories of rationality that can only accommodate them in an *ad hoc* manner.

To clarify the relationship of a historiographical theory to its anomalies, Lakatos makes a distinction between internal and external history, which differs from what historians typically mean by the internal-external distinction. For Lakatos, internal history, or what he sometimes called the *rational reconstruction of science*, is history selected and organized around a particular philosophy of science. External history consists only of ''socio-psychological'' details that are invoked when the internal history falls short. Lakatosian internal histories are to exclude all topics that reflect personal, subjective, or irrational elements. Moreover, Lakatosian internal histories are ''improved'' versions of history, presenting the rationale behind a scientific episode even if it is not an accurate description of what happened. Because sometimes an internal history can be literally untrue, Lakatos advises, ''One way to indicate discrepancies between history and its rational reconstruction is to relate the internal history in the text, and indicate in the footnotes how actual history 'misbehaved' in the light of its rational reconstruction.''[16] Internal history is the history of what would have happened if people had consistently behaved in a rational manner.

Lakatos' differentiation between internal and external history provides a way to adjudicate between competing methodological theories. Each scientific methodology will offer different criteria for rationality in science, and so each methodology will offer different internal histories. Falsificationists like Popper, for example, portray the history of science as a sequence of risky predictions and crucial experiments. The more that a particular approach can explain exemplary episodes in the history of science through its internal history, the more rational it is. One can also say a historiographical research program is progressing if an increasing number of historical episodes can be reconstructed as rational. Lakatos says his own methodological theory is to be preferred over others because it predicts in

history that there will be ''long-extended theoretical and empirical rivalry of major research programmes, progressive and degenerating problemshifts, and the slowly emerging victory of one programme over the other.''[17]

But why should they reconstruct or clean up history by removing all the irrational or subjective elements from it? Why should historians ignore the psychological states of individual scientists in order to describe the objective development of knowledge? Lakatos thinks rational reconstructions are useful and helpful because of his own commitment to the ontology of Karl Popper.

Popper's ontology consists of three levels or ''worlds.'' The first world is material, the second is mental, and the third is ''the world of propositions, truth, standards: the world of objective knowledge.''[18] While the first two worlds are reminiscent of Cartesian dualism, Popper argues that the third world is the domain of human knowledge, which is subject to its own descriptions and laws and cannot be reduced to second world events any more than second world events can be reduced to first world events.[19] In terms of Popper's ontology, Lakatos' internal histories are third world histories, unconcerned with the producers of knowledge that inhabit the first and second worlds, instead focusing exclusively on the growth of knowledge itself. As Lakatos explains, ''Kuhn certainly showed that the psychology of science can reveal important and, indeed, sad truths. But ... *the—rationally reconstructed—growth of science takes place essentially in the world of ideas, in Plato's and Popper's 'third world'*, in the world of articulated knowledge which is independent of knowing subjects.''[20] The invoking of the third world explains why internal historians need not worry about the messiness of actual history—or even that ''real'' history sometimes contradicts internal history—for its muddled mix of subjective and objective beliefs is only a caricature of its counterpart in the third world.[21]

## Evaluation of Lakatos

The most significant criticism of Lakatos' work centers on whether he was able to reconcile the projects of Popper and Kuhn.[22] While Lakatos found Kuhn's theory of scientific change to be superior in many of its historical details, he agrees with Popper by saying that a normatively binding philosophy of science is necessary to distinguish between good science and pseudoscience. There are two central problems, however, that raise doubts as to the adequacy of Lakatos' philosophy.

The first problem concerns its ability to provide objective guidance between scientific theories. Lakatos' philosophy intends to explain the rationality of iconic episodes of science but provides no forward-looking assessments of current scientific theories.[23] Indeed, it is not clear that Lakatos' brand of falsificationalism could kill a theory at all. Lakatos says that his philosophy is not designed to give advice about how to produce good theories, or even on which theories scientists should work. He says, ''My 'methodological rules' explain the rationale of the acceptance of Einstein's theory over Newton's, but they neither command nor advise the scientist to work in the Einsteinian and not in the Newtonian research programme.''[24] Lakatos' philosophy was designed to show why theories we

currently accept might, with hindsight, be rationally preferred. It was not intended to provide advice for when a stagnating program should be abandoned in favor of a more progressive one, or a progressive program in favor of a competitor.[25] Since programs have advanced and degenerated numerous times, it may be rational to pursue research in a degenerating programme branch with a superior rival.

The difficulty with this response is that it eviscerates the prescriptive aspect of Popper's philosophy of science. The popularity of Popper's philosophy among scientists is mostly attributable to his willingness to provide advice to scientists on how to conduct their day-to-day research.[26] Lakatos' work, by contrast, only attempts to explain the rational superiority of beliefs that are widely held by the scientific community. Lakatos wants to use his methodology to look backwards through history in order to explain the rationality of what is already known, no matter how often current theories may change. But science is lived forwards, and methodologies are useless unless acted upon.[27]

Lakatos moderates slightly on this point by saying that scientists who work on degenerating programs should not have their articles published and research foundations should not fund their projects.[28] Lakatosian scientists would have total freedom to work on whatever topics they choose, just as ''long as they publicly admit what the score is between them and their rivals ... Appraisal does not imply advice.''[29] It can be rational to play a risky game (i.e., continue to work on a degenerating research program), but one should not be deceived about the risk.[30] While a scientist is not irrational for working on a degenerating program, institutions should avoid supporting their work.

Even if one grants this point to Lakatos, however, there are numerous problems about how to apply his ''objective'' methodology. As soon as Lakatos sets forth clear criteria for choosing between paradigms or research programs, he immediately begins to qualify his account so that it will not contradict the history of science. For example, Lakatos argues that a progressive problemshift in a research program need only be ''intermittent,'' and that its heuristic power (i.e., the ability to anticipate new facts) can frequently be seen only in hindsight.[31] Furthermore, a defeated research program can be rationally defended because everyone is ''allowed a few such defeats.''[32] The vagueness of the terms ''intermittent'' and ''few'' means that journal editors will have to rely upon their own ''unarticulated common sense'' for identifying a degenerating problemshift. Unfortunately, this strategy is exactly what he criticized as mysterious elitism in the work of Kuhn, Pierre Duhem, Michael Polanyi, and others because it leads to a scientific authoritarianism where the public has no way to judge scientific work.[33] The ambiguity of Lakatos' criteria means that his standards are of limited value in settling live scientific controversies.

Moreover, Lakatos' philosophy fails to address a central implication of Kuhn's theory: that ''competing paradigms often do not credit the existence of certain of each other's problems, predictions, and corroborations.''[34] For example, over a century of post-Lavoiserian chemistry could not recognize or pursue certain questions posed and solved by phlogiston theory because of differing research interests, exemplars, and capabilities of the actors. Without a neutral way to judge whether a program is progressive or degenerating, it is impossible to have

publicly agreed upon ''scores'' that reflect the current success of the program. It has even been difficult for followers of Lakatos' to learn to apply his theory in a consistent way, for in practice it has been difficult for them to distinguish hard cores from heuristics in a non-arbitrary fashion.[35] If Lakatosian philosophers of science find it difficult to apply Lakatosian reasoning to new scientific theories, how can one expect journal editors to fare any better? The ambiguous nature of Lakatos' advice leads the philosopher Paul Feyerabend to say, ''The Skeptic, on the other hand, will be utterly unimpressed by standards which are compatible with any action. For him such standards are standards in appearance only.''[36] Lakatos' methodology is ambiguous at best, inapplicable at worst.[37]

The second major weakness of Lakatos' philosophy is the way it handles the history of science, which was supposed to be one of its major strengths. Lakatos' history is unabashed Whig history, in that it uses current accepted scientific practice to evaluate scientific theories of the past. His internal histories can even sometimes be ''their radically improved version.''[38] These moves are supposedly justified because his histories are ''third world'' histories, which reflect Popper's independent realm of knowledge and not the psychological state of individual minds, which are in the second world.

Kuhn pithily states the main problem with Lakatos' approach to history: ''What Lakatos conceives as history is not history at all but philosophy fabricating examples.''[39] While historians need to be aware of the normative commitments that shape their work, Lakatos argues that historians cannot properly do their work without fully explicit normative methodologies. It is philosophy that sets the criteria by which one does Lakatosian history. But this approach invalidates the central lesson of post-Kuhnian history of science: that one's philosophy should attempt to conform itself to history, not vice-versa. Lakatos' methodology produces historical narratives that are scarcely histories at all, for it grants a free license to ignore the ''misbehavior'' of actual history. It is untenable from a historiographical prospective to decide in advance that a certain sort of evidence shall not even be considered.[40]

Lakatos approaches the history of science like a philosopher, with the ambition of imposing a universal model onto the history of science. Historians, by contrast, are comfortable with the messiness, complexities, and contradictions of history, and so feel no need to try to squeeze history into an all-encompassing philosophical framework. The universalizing tendency of Lakatos undermines the central methodological practice of current historians, which is to understand scientific theories with respect to the particular community, and its rationality, that produced them. As Brendan Larvor says, for the historian, ''To try to work it up into a general theory of scientific revolutions is as unhistorical as to try to fit the Hundred Years' War into a general theory of wars.''[41] By attempting to produce histories of universally valid knowledge, Lakatos reconstructs actions and beliefs into terms that do not exist for the actor.[42]

Finally, Popperian ontology cannot justify Lakatos' historiographical practice. Many philosophical problems have been raised against Popper's hypothesis of the ''three worlds''; some think Popper's reliance on analogies from biology is questionable, and others believe it trivializes all questions of ontology, because if

you think of X then for Popper there exists the X that you think of.[43] However, the main objection from a historian's perspective is that important questions cannot be answered without reference to personal and social factors.[44] The personal dimension of scientific inquiry, far from being an inessential part of scientific history, reveals crucial lessons about the scientific process and human rationality. Moreover, historians often admit several types of overlapping explanations into the same account, ruling out the possibility that there could ever be one single, ''third world'' explanation. Historians would thus agree with Kuhn: ''When one's historical narrative demands footnotes which point out its fabrications, then the time has come to reconsider one's philosophical position.''[45]



## Nancey Murphy and Lakatosian philosophy

Having considered Lakatos' view in detail, I will now examine the way that his work was appropriated and applied to theology by Murphy. As I said in the introduction, she no longer endorses Lakatosian methodology in the same manner she once did, now preferring Alasdair MacIntyre's work on rationality instead. Yet it is useful to revisit her early work because of its clarity and her command of Lakatos' work, which is partly a result of obtaining her first doctorate in philosophy of science under the supervision of Paul Feyerabend, the friend and critic of Lakatos' philosophy quoted earlier. Her work cannot stand for all of Lakatosian science and religion scholars, of course, but it suggests how problems in Lakatos' work manifest themselves in the work of his followers.

Murphy offers a strong reading of Lakatos' philosophy in *Theology in an Age of Scientific Reasoning*, focusing on his evaluative criteria instead of the qualifications that affect the evaluation of research programs. Murphy does not, for example, mention that Lakatos' work offers no advice to the individual scientist, or that progress is usually only seen with hindsight. Her reason for this, as I will explain below, relates to the difficulty of theological reasoning. Here is Murphy's summary of Lakatos' method of evaluation:

> Evaluation of a (putative) scientific theory, according to Lakatos, involves four considerations. Has it taken the form of a research program? Has it anticipated any novel facts—is it progressive? If the answer is yes to both of these questions, it is scientific. (If it has the form of a research program but consistently accounts for data in a post hoc manner, it is pseudoscience). Has it developed in accordance with a positive heuristic? If so, it is mature rather than immature science. And, finally, is it more progressive than its rivals? If so, it is the theory to accept.[46]

In Murphy's presentation, Lakatos' new normative methodology provides ''objective reasons'' for preferring one theory to another.[47]

Murphy was aware of the criticisms of Lakatos' philosophy and devotes much more time in *Theology in the Age of Scientific Reasoning* to defending Lakatos, than presenting the nuances of his position. For example, she revises Lakatos' definition of a ''novel fact'' so that it takes account of criticisms that Lakatos was unable to respond to before his death.[48] She also rejects criticisms of Lakatos' methodology

as a historical research program. Granting too much on this point would imperil Lakatos' claim that his methodology can explain more of the history of ''good'' science than his competitors can. Murphy is impatient, as was Lakatos, with an attempt to invalidate his philosophy through a quick appeal to a historical example, for that presumes the same naïve falsificationist philosophy of science that he rejects. She also defends his division of internal and external history, saying the explanation of a scientific episode depends crucially on whether the scientific theory is correct. It is only when the answer is wrong that we need to invoke psychological or other factors (i.e., external history).[49] She does agree, however, that Lakatos was not always as clear about what counts as a ''better'' reconstruction of history. She thus offers her own rational reconstruction of Lakatos: ''I suggest that the following, more guarded statement is more in line with Lakatos' best thought, though somewhat different from what he sometimes said: The best methodology is one that allows us to reconstruct as rational more of the positive value of judgments of the scientific community than does any of its current competitors.''[50] Murphy's reworking of Lakatos' theory provides clear criteria for evaluating scientific methodologies, even if application of those criteria may be less straightforward. The hard Popperian elements of Lakatosian philosophy of science become even harder in Murphy's version.

After presenting and defending Lakatosian philosophy of science, Murphy explores what this more sophisticated philosophy of science might imply for philosophers of religion interested in the rational status of religious belief. A central aim of Murphy's work is to show that Lakatos' philosophy is applicable to theology, meaning that ''theological research programs'' exhibit the same structure as scientific research programs and that some theological programs are progressive. If theology can be shown to be scientific by demonstrating that some theological programs meet the scientific standard of Lakatosian methodology, Murphy argues that this would be an important rebuttal to the general skepticism towards religion generated by the work of David Hume.[51]

Murphy offers a number of specific examples of theological research programs that resemble the Lakatosian structure that she has described. In Wolfhart Pannenberg's theological system, for example, the hard core is that ''the God of Jesus Christ is the all-determining reality.''[52] The nature of Pannenberg's hard core places a further burden on the positive heuristic, as it calls not only for the reinterpretation of the tradition but also confirmation from all branches of knowledge. To meet this added burden, Pannenberg has developed a number of distinctive auxiliary hypotheses, especially his theory of revelation as history and his interpretation of certain New Testament passages. Murphy also devotes an entire chapter to analyzing the ''Catholic Modernists,'' a movement whose hard core was the impulse to reconcile the Catholic heritage with modern thought.[53] She describes how theologians in this tradition made successive revisions to the auxiliary hypotheses, each time refining the theological research program in line with its positive heuristic. Murphy thus concludes that there are many theological research programs with the same structure as Lakatosian research programs: a core theory that is immune from falsification, auxiliary hypotheses, and data (e.g., Scripture, history, or experience).

While Murphy says it is significant that many theological systems can be reconstructed as research programs, the bigger question is whether it can be shown to be empirically and theoretically progressive so that competing theological programs might be compared. In the case of the Catholic Modernists, says Murphy, there was clear theoretical progress. The modernists were able to devise a number of new auxiliary hypotheses in light of the hard core, and each new model of Catholicism offered empirical predictions.[54] However, Murphy says that it is unclear whether many of those predictions have been corroborated: ''Although a few predictions could probably be corroborated easily, it would obviously take years of work to fully evaluate Tyrrell's program.''[55] The main problem is that without the benefit of Lakatosian philosophy of science, modernists such as George Tyrrell provided no records of novel corroborations.[56] It would be much more straightforward to evaluate their work if modernists like Tyrell made explicit what was novel in their program, rather than *ad hoc* modifications in light of other programs. Problems in evaluating the Catholic Modernists thus reflect flaws in their approach, rather than inherent problems in doing ''theology scientifically.''[57]

Any disappointment about Murphy's inability to evaluate the Catholic Modernist program fully is somewhat mitigated by the fact that she does not identify any current theologians who are working on the program. Pannenberg's theology, by contrast, is an active program to which Murphy thinks she can contribute. She says that Pannenberg may be the ''boldest attempt in this generation'' to establish the credibility of Christian belief through probabilistic reasoning rather than authoritative tradition.[58] Yet its main weakness is that the scientific methodology employed by Pannenberg cannot prove, on its own terms, the rational superiority of his work against Hume. So can Murphy reconstruct Pannenberg's argument so that there are objective reasons for preferring him to Hume?[59] While she is able to reconstruct Pannenberg's program in Lakatosian categories, again she is unable to ascertain whether Pannenberg has confirmed novel facts. In a footnote, Murphy does mention two novel facts identified by Pannenberg himself, but makes no attempt to assess them.[60]

To summarize, then, Murphy's two central examples of theological research programs have not been shown to exhibit empirical progress, they only display the structure of Lakatosian research programs. This, I think, reveals the ambiguity of Lakatosian methodology. For all the promise of objectively deciding between rival programs, Murphy provides no examples of a decisive encounter from the history of theology. The reason, I suggest, is that the history of theology does not fit easily into a Lakatosian schema, just as I argued that the history of science does not. While the concept of a novel fact may be useful in certain contexts, it is too fine an instrument to account for all the complexities of human rationality.

The fundamental limitations of Lakatosian methodology are seen elsewhere in Murphy's work. As I repeatedly show, Murphy interprets Lakatos as presenting a ''clear and toughminded notion'' of novel facts, which will ''provide much-needed pressure to make theological programs perform.''[61] But at the end of the book, Murphy seems to recognize that things are not so simple. She says, ''In philosophy of religion the important point of contention is still whether it is *possible* to be a rational theologian. Here the game is won by anyone who can show that theology

is in the same ballpark with science, and no points should be taken off if one cannot give sharp answers about when to give up on Pannenberg's or the modernist's programs ... those involved in the program have a pretty good sense of whether there is still productive work to be done there or not.''[62] Murphy here acknowledges the difficulty of getting ''sharp answers'' when applying Lakatos to theology, which she tries to minimize through the appeal to the ''good sense'' of those involved in a program. The problem with appealing to good sense is, as I explained above, that it is the very thing that Popper's type of philosophy was supposed to overcome. The whole point of continuing to identify with Popper's falsificationist philosophy is that Lakatos believes that it is possible to formulate rational standards that are readily understandable and applicable for those outside the program. Reliance upon tacit forms of knowledge (i.e., good sense) does play an important role of human rationality, but is incompatible with a truly Popperian philosophy of science.

A final example of the inability of Lakatosian philosophy of science to provide clear criteria for rationality is that it can be used to support religion at all. The first subtitle of Lakatos' central paper on the Methodology of Scientific Research states the question, ''Science: Reason or Religion?'' which indicates Lakatos' pessimistic view on the rationality of religious belief.[63] Because Murphy offered a Lakatosian defense of the progressive nature of Freudian psychology while at graduate school in Berkeley, she has defended two of the three intellectual systems that Lakatos' methodology had clearly designated as exemplars of pseudoscience. The way Lakatos' philosophy is so easily turned to defend religious belief rather than condemn it, serves to indicate that whether or not one thinks a research program is progressive may depend on which Lakatosian is applying the analysis.

While I think these objections to Murphy's earlier endorsement of Lakatos are sufficient to find it unworkable, I will add one more because it is especially conspicuous. The peculiar ontology that Lakatos accepts in order to justify his use of rational reconstructions is suggestive of Cartesian dualism with its separation of physical and mental ''worlds,'' with another layer (i.e., the ''third world'' of objective knowledge) added for good measure. I thus find Murphy's earlier espousal of Lakatos' philosophy to be inconsistent with her firm opposition to Cartesian dualism and philosophies that presuppose it.[64] How can a nonreductive physicalist accept the trifurcation of reality in this manner? Any Lakatosian should indicate whether they accept Popper's ontology and, if not, how they would justify the use of ''rational reconstructions'' in their own version of Lakatosian philosophy, even when it puts them at such odds with current historians of science.

## For MacIntyre

While Murphy still endorses certain aspects of Lakatosian philosophy of science, she says, ''I have evolved from being a Lakatosian to being a MacIntyrean.''[65] The reason she gives is that Lakatos was never able to overcome Feyerabend's criticism that Lakatos could not offer a convincing rationale for abandoning degenerating research programs since they could become progressive in the future. According to

Murphy, Alasdair MacIntyre provides an answer to Feyerabend by arguing that a superior tradition is not only more progressive but also can provide an explanation for the failure of its rivals. If an epistemological tradition can explain why its rival tradition ''had to fail,'' then there are good reasons to abandon it.

While I worry that Murphy might be portraying encounters between rival traditions in a more decisive way than MacIntyre's epistemology allows for, I agree with her preference for MacIntyre's theory. Having described major flaws in Lakatos' philosophy of science, I close this article with some reasons why MacIntyre is superior.

One of the most notable features of MacIntyre's work is its detailed description and critique of Enlightenment theories of rationality. A defining characteristic of these theories is the belief that there can be a single standard of reason that is applicable at all times and to all scientific disciplines. As MacIntyre explains, ''[For Enlightenment thinkers] ... it was a guiding presupposition of thought that substantive rationality is unitary, that there is a single, if perhaps complex, conception of what the standards and the achievements of rationality are, one which every educated person can without too much difficulty be brought to agree in acknowledging. The application of the methods and goals of this single and unitary conception to any one particular distinctive subject matter is what yields a science.''[66] Enlightenment theories of rationality then are closely intertwined with philosophy of science. In order to show that a discipline is rational, one has to show that it can be made scientific, a designation to which all reasonable inquirers would assent.

Some have suggested that Lakatos foreshadows a postmodern view of rationality because, for example, he allows research programs to unfold based on their own heuristics. Nevertheless, Lakatos' project stands in the Enlightenment tradition as MacIntyre describes it. As a good Popperian, Lakatos tries to articulate the methodology of ''science,'' hoping to uncover the logic of justification that all sciences share. Lakatos hoped that his theory of scientific rationality would provide demarcation criteria to distinguish scientific theories from those that are pseudoscientific (i.e., not theoretically progressive). He also argues that there should be ''public scores'' between rival programs, to which all insiders and educated outsiders could agree. Indeed, the Enlightenment assumptions of Lakatos' work have drawn many theologians to it: if Christian theology can adhere to the meta-standards of science, then skeptics can no longer doubt its rationality.

The problem with the Enlightenment view, according to MacIntyre, is that rational inquiry can only take place from within specific intellectual traditions, which precludes the idea that meta-criteria can be given for deciding between rivals. Rather, what is rational depends on one's context and community. Humans are born into communities that shape their presuppositions; as those persons who share basic commitments try to solve problems they create traditions, extended debates in which others must be initiated before they can fully participate. In the absence of shared basic assumptions on the part of dialogue partners, conversation breaks down and progress becomes impossible. MacIntyre thus agrees with Kuhn against Popper and Lakatos that there can be no universal criteria for rationality.

But MacIntyre does not draw a pessimistic conclusion from the lack of neutral criteria for deciding between rival traditions. Rather, he says it is incumbent upon rational inquirers to ''enter into controversy with other rival standpoints, doing so both in order to exhibit what is mistaken in the rival standpoint and in light of the understanding afforded by one's own point of view and in order to test and retest the central theses advanced from one's own point of view against the strongest possible objections to them to be derived from one's opponents.''[67] As Murphy rightly shows, though MacIntyre allows for decisive encounters between opposing traditions, he avoids the temptation to provide a universal criteria for adjudicating between paradigms. Global theories of rationality are too crude to be of assistance when facing concrete research problems.[68] Consequently, the epistemological task of MacIntyrean-inspired theologians is to engage the particular arguments of rival traditions, not to attempt to publically demonstrate the scientific nature of their own discipline.

A final reason for preferring MacIntyre's theory is that it more closely aligns with current historiographical practice. As I described above, Lakatos thought it was justifiable to rationally reconstruct the history of science so that it fits with the best theory of rationality. But this approach—derided by historians as ''Whig history''—is fundamentally at odds with the impressive body of scholarship on the history of science that has been produced in the last three decades or so. Whig history is problematic because it tailors the narratives of the past in order to ratify the prejudices of the present.[69]

In MacIntyre's theory, by contrast, history is not to be retrofitted to meet present concerns but a resource from which one learns how to be rational. Because rationality is inseparable from the tradition in which it was achieved, a novice must appropriate the best arguments and ideas to emerge thus far to become rational, learning to employ them persuasively while also subjecting them to further scrutiny. Instead of the Enlightenment emphasis on rationality as a result of the application of a universal method, MacIntyre says that all claims to knowledge come from particular persons, who build upon the efforts of others.

In conclusion, Murphy has long advocated a position that she calls ''Anglo-American postmodernity,'' one that attempts to move beyond Enlightenment assumptions about rationality that has been identified by MacIntyre and others. What I have argued here is that Lakatos' position, true to its Popperian heritage, is too wedded to modernist assumptions to be a plausible theory of rationality. Indeed, Lakatos represents the end of an era in philosophy of science; one is hard pressed to find global theories of scientific progress in the philosophy of science literature these days. It is time for science and religion scholars to put his theory to rest.

## Endnotes

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