

## ***PROGRESS IN NATURE AND CULTURE***

### ***How Biology Can Have the Best of Both Worlds***

Essay Review of

***Monad to Man: The Concept of Progress in Evolutionary Biology*** by Michael Ruse. Harvard University Press. Cambridge, MA. London, U.K. 1996. 539 pp. Bibliography. Index. Notes. ISBN 0-674-58220-9.

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#### Description

The shorter version of this book has been called ‘Ruse’s Recantation’ or ‘Ruse’s Folly,’ depending on one’s point of view. This event happened at the 1993 annual meeting of the American Association for the Advancement of Science. Michael Ruse’s mandate was to refute Phillip Johnson’s book *Darwin on Trial*. In it Johnson argues that evolutionary thought is constituted as much by philosophical naturalism as by scientific evidence. When the floor was opened for discussion there was a stunned silence. “State of shock?”, Ruse asked. Shocking it was. Instead of the expected rebuttal, Ruse had agreed with Johnson. Only ten years earlier at the Creationism Trial in Arkansas Ruse had testified that Creation Science was unscientific because it requires philosophical assumptions unlike Darwinism. His change of mind was seen as support for the scientific creationists in their campaign to have the teaching of evolution removed from state schools. Worse, evolutionary biology had lately matured into a professional science worthy of tax payer support or so it appeared. Now it had been paired up again with that dame with whom no biologist wants to be seen, but without whom no biologist can live. Her name: Progress. *Monad to Man* provides the background for Ruse’s recantation.

Evolutionary thought remains controversial (4) not merely for empirical reasons. This controversy, Michael Ruse argues, enters evolutionary thought via its link with the idea of cultural progress (Progress). The idea of Progress is controversial because it has links with ideas ranging from the

quasi-religious and the political, via the economical to the social. For another indication of how controversial the topic of evolution and Progress has been, see Nitecki (1989). The idea of Progress, Ruse concludes, has prevented evolutionary thought from satisfying the epistemic requirements of a mature science and thus from acquiring professional status. Yet he also argues that the mutual engagement of evolutionary biology and the idea of Progress is inevitable; but he stops short of concluding that good evolutionary biology is possible in spite of the idea of Progress.

What evidence can be presented in support of a causal link between someone's ideas of cultural progress (Progress), biological progress (progress) and evolutionary theory? Suppose you are personally devoted to the idea of Progress. This commitment may emerge both in the idea of biological progress and in the way specific theories move beyond data. Therefore, there are three areas where you can look for a consilience of evidence. Ruse looks for manifestations of the idea of Progress in a person's biological thought (proof #1), commitment (proof #2) and theory (proof #3). First, a person's biology must have the overall shape one would expect if it had been informed by the idea of Progress (proof #1). One would be looking for a view of life as progressing through stages of increasingly higher value. Depending on one's conception of Progress, cultural, social or spiritual, the satisfaction of this requirement can take different forms. In Lorenz Oken, for instance, the development from less to more complex organisms is interpreted as an improvement in value as one approaches 'Man' at the top -- the universal spirit of German idealistic philosophy. Proof #2 consists of public or private indications that the biologist personally values the idea of Progress. For instance, Ruse reveals a deeply religious and existential context for Dobzhansky's acceptance of evil as the price for God-guided evolutionary progress towards greater personal freedom (see below). Thirdly, the content of the biological theory must be informed by the idea of Progress (proof #3). In this proof, Ruse uses the fact that theory is underdetermined by data. If biological theory outstrips biological evidence in a way consistent with the idea of biological progress, this is taken as proof that the idea of Progress has affected biological theory (40). For instance, "[Dobzhansky's] spiritual

Progressionism depended crucially on a belief in freedom, and that in turn made biological freedom imperative” (400). Biological freedom informed the balance theory in the form of genetic variability of populations and its promotion by drift or selection. Since there was a competing theory (the ‘classical’ theory), clearly the balance theory went beyond the data, Ruse argues. But how can the rationale for extending theory beyond evidence be attributed to the idea of Progress when there may be other non-evidential reasons for extending it in this way? Ruse proposes that the Progressionist extension must be held against strong opposition either from a dominant anti-Progressionist line of thought or from other non-Progressionist options, or even from the biologist’s personal preference. For instance, there is a strong cultural trend against evolutionary progress in N. America. According to proof #3 this would mean that those in North America who hold a theory of progressive evolution in the absence of evidence do this on account of a biological progressionism provided they can be shown to be personally committed to Progress (proof #2) and the remainder of their biology is consistent with this commitment (proof #1). Together these three proofs rule out the possibility that any two of the three have a Progressive content by mere coincidence.

The bulk of the book consists of approximately forty case studies. Each is assessed in terms of proofs 1-3. Beginning with French, German and British biologists from the 18<sup>th</sup> and 19<sup>th</sup> centuries (Chs. 2-3), Ruse moves on to Charles Darwin (Ch. 4). For the post-Origin period he focuses on Britain and the U.S.A. Covering biologists from before and after the rediscovery of Mendel’s laws, Ruse moves from the nineteenth into the twentieth century (Chs. 5-11) including current evolutionary biology. Each chapter opens with a sketch of the relevant historical and cultural context. This is followed by a description of the ideas of selected scholars to which are applied the three criteria for a metaphoric transfer of knowledge from Progress via progress to evolutionary biology. Each chapter concludes with an evaluation of how evolutionary biology has been shaped by the idea of Progress and how this affected its professional status.

For two centuries the ideas of biological evolution, biological progress and human progress appear to have been closely linked. This, Ruse argues, was a liability for anyone who wanted professional status for evolutionary biology because P/progress was associated with speculative metaphysics, it functioned as a substitute religion, it had no empirical basis, and it failed to produce economic benefits and attract grants. As a result, for the first century of its existence evolutionary thought was considered a pseudo-science. Darwin raised its status to popular science, but so it remained until well into the twentieth century. While Ruse does not claim that the expulsion of the idea of P/progress from biology is necessary for the professional status of current evolutionary biology, he does claim that historically the desire to be taken as professionals was the main reason for the expulsion.

Ruse also claims that the expulsion of the idea of P/progress was progressive (526). It is true that by the mid-nineteenth century T.H. Huxley had concluded that a mature biology has to be value-free. However, the idea of P/progress continued to inform evolutionary studies primarily because metaphysical and religious interests drove the scientific questions asked (538). Since the middle of the nineteenth century, the record is punctuated with exceptions such as Agassiz, J. Huxley, Fisher, Dobzhansky, Gould, Lewontin and Wilson who allowed their metaphysics or religion to shape their biology against the proposed trend of expelling them from professional science. For instance, the problem of evil was an enduring religious quest for Dobzhansky. He believed that “evolution, like everything in the world, is a manifestation of God’s activity” (407) and that evil is the price to be paid for progress towards organisms with the greatest freedom and adaptability (397-99). Evil and biological progress were two sides of the same coin. That is why Dobzhansky could not keep the idea of P/progress out of his evolutionary theory: the balance theory affords maximum adaptability and freedom to a population because it favours heterozygotes.

How are culture and biology linked? Briefly, the link is causal, not logical (13, 506). We learn that thoughts of P/progress enter into evolutionary thought by being re-interpreted into forms fruitful in

biology. This occurs by the use of metaphors such as Wright's adaptive landscape (448) or Simpson's 'evolutionary trends' (449). Says Ruse: "there is the centrality to all the synthetic theorists' work of Wright's adaptive landscape, a deeply progressionist notion." More can be learned about this from Wykstra (1996). Based on the history of physics, he suggests that a metaphysical or religious belief can be transformed into a specific testable hypothesis with the help of metaphor, but that the link is detachable. Ruse, too, emphasizes that the metaphor of the adaptive landscape does not entail progress logically and that no one would touch it if it did (450). Further, the content of evolutionary biology is not entailed by the idea of P/progress, but evolutionary biology may be informed by it (536). That is, the link is causal. This is why the idea of P/progress has the status of an interpretation of evolutionary theory. Logically, evolutionary theory can be disconnected from the idea of P/progress (460-84) and historically, P/progress has not been the only (or major) reason for being an evolutionist (531). As Ruse puts it in characterizing Dobzhansky's popular work: "Those who liked the religion could keep it, and those who did not could drop it." The elimination of the influence of P/progress does not seem to necessitate the substitution of another cultural value of the same (religious / metaphysical) category because it was expelled by professional status, a cultural value of a different kind. (533-34).

Evolutionary theory may not be linked logically to the idea of P/progress. However, Ruse concludes, these ideas are not about to disappear as a reason for having an evolutionary biology. First, evolutionary biologists see themselves as a product of evolution. Therefore, progress is the anthropomorphic perspective from which evolution tends to be seen. Also, scientists believe they are finding truth, and if you are an evolutionary scientist, the cultural progress of science is generalized to include organic progress. Finally, everyone learns about evolution through popular science. In it the idea of Progress functions as a substitute religion giving meaning to life. This applies also to many professional evolutionists who look for meaning in life by interpreting evolutionary theory in terms of P/progress.

Throughout, the book benefits from Ruse's sociological approach to understanding the history of ideas, but it is not an exercise in social construction. He considers a range of engagements between culture and evolutionary thought including linguistic, social, psychological, epistemological, economic and religious influences. He treats them with an even hand avoiding a reduction of the epistemological to the social dimension while demonstrating that they often merge (445).

### Evaluation

The idea of P/progress is a fortunate choice because of its many cultural connections. For those interested in the relationships between disciplines it is a concept that mediates between the social and the natural sciences. For those interested more specifically in the engagement of religion and science, the concept of P/progress has a long history encompassing both. For one, Fisher and Dobzhansky interpreted P/progress as divine Providence, thereby engaging religion, metaphysics and science in the same way as the concept of Nature did for Newton. Newton saw natural phenomena as manifestations of divine action. Fisher and Dobzhansky saw P/progress as divine Providence. This fulfills a classic condition for the merger of thought about God and Nature. Such mergers make it impossible to separate religion and science into entities that interact (Brooke, 1996: 3). Secondly, P/progress has functioned as a substitute religion (29, 35-36). This leads to the conclusion (not drawn by Ruse) that the engagement of science and religion is not, as some argue, a thing of the past occurring only in overtly religious times and cultures. Since there is every reason to believe that the idea of P/progress will continue to function as a secular religion, so will the engagement of science and religion continue to be with us.

How strong is the evidence that Progress drives progress drives evolutionary theory? The three supporting proofs are linked because they are manifestations of one underlying metaphor representing a

metaphysical commitment to P/progress. As metaphor, the idea of Progress shapes biology as a whole by importing the idea of cultural progress (#1). The metaphoricity of cognition involves the individual knower (#2). And metaphor as bearer of knowledge creates cognitive tension in the target domain by imposing knowledge from a source domain thereby extending theory beyond evidence (#3). If cognition is metaphorical, this linkage is unavoidable and, therefore, other independent proofs are not available. Ruse does not present them as three independent pieces of evidence and they should not be taken as such lest they receive undue weight. However, given the difficult task of isolating one from among several contextual factors that may have shaped the content of scientific explanation, a consilience of these three proofs may be the strongest possible indication that the factor underlying the proofs has shaped the science.

Such a consilience may not always be possible within each of the proofs. Take, for instance, proof #2 in the case of Sewall Wright. Ruse interprets Wright's metaphor of the adaptive landscape as introducing P/progress into evolutionary thought. His personal commitments, too, include such metaphysical notions as emergent evolution, dynamic equilibrium and process thought. Why did Wright participate in a philosophical seminar on the unity of science at the University of Chicago in the mid-1930s (Smocovitis, 1996: 204)? If he was a practicing positivist, this appears to be inconsistent with his having metaphysical commitments. While in most case studies proof #2 appears to be straightforward, this example illustrates the delicacy of interpreting a complex situation.

The application of proof #3 is problematic. Sections on proof #3 tend to begin with Ruse saying that given the overall progressive evolutionary shape of someone's biology (proof #1) and this person's personal commitment to P/progress (proof #2), it is redundant to consider whether this biologist's evolutionary theory extends beyond evidence in a progressive way (proof #3). Proof #3 is assumed to be confirmed. As a result it remains unclear whether it is in the theory or in the popular opinion that P/progress outstrips the evidence. Also, one cannot assume it is in the theory because not every

biological theory will go beyond the evidence as directed by P/progress just because this is the overall pattern of this person's biology. For instance, Stebbins is shown to publish his professional evolutionary studies in specialist journals and to reserve his thoughts on P/progress for the popular press (429-38). The extension of his popular work beyond evidence is shaped by P/progress, but not his professional biology (#1). One, therefore, expects the conclusion that proof #3 is negative. Instead, Ruse implies it is confirmed in light of Stebbins popular Progressivism to which he refers (437). How relevant is it to demonstrate that the biological evidence was outstripped by Stebbin's *popular* views on biological progress? Proof #3 is designed to reveal whether his *professional* theories outstripped the biological evidence. Ruse is unclear on whether proof #3 is satisfied when a professional theory or a popular opinion outstrips the evidence. Throughout the book this treatment of proof #3 weakens the conclusion that Progress informs professional evolutionary theory.

A second problem with proof #3 is that a biologist may prefer progress over other options for no metaphysical or religious reason at all. Presumably all sorts of values can fill the gap in a theory left by evidence: political, moral, social, economical and religious. For instance, when Mayr (445) explains animal behavior in terms of goals, he does so for empirical reasons *and* because he wants to differentiate biology from physics for political and economic reasons. The position is held strongly for there are several reasons for it, but none of them is metaphysical or religious. Going against mainstream Progressionist tendencies, then, may be due to the combined effect of several other reasons rather than to a strong commitment to non-P/progressionism. Given a variety of sources that could shape the direction in which theory is extended, how does one establish which one(s) play the causal role? The documentary evidence must be detailed indeed to reveal the full complexity of the context.

The third problem hampers the application of proof #3. That someone would stretch the evidence (proof #3) in ways consistent with his/her personal metaphysical commitments (proof #2) is to be expected in light of what is known about the metaphoricity of cognition. Facing the unknown, knowledge

can be imported from any source by metaphor, be it from metaphysics, religion, economics, sociology or popular science. Neither is it surprising that this personal commitment will show up in the overall shape of someone's biology. Thus, in order to attribute the extension of a theory beyond evidence specifically to the influence of the idea of Progress, Ruse requires that the extension oppose one or more strong cultural alternatives. Making theory choice socially and professionally costly is valuable because it can eliminate cases in which the metaphysical basis for theory choice is a veneer covering up the real economic and political reasons. Unfortunately, on this score the book is disappointing. Only in seven of the approximately forty-one cases are counter-trends to the extension of theory beyond evidence explicitly identified in the discussion of proof #3. These include: Agassiz (116), Owen (121), Darwin (on "struggle," 166, 168), Cope (264), Dobzhansky (balance theory vs classical theory, 400) Mayr (448), and Maynard Smith (480-81).

Fourthly, the counter-trend required for proof #3 must be a *functional* one because a culture always has a variety of subcultures. Scientific disciplines and countries can have different subcultures (e.g. Harwood, 1993). Ruse's revelation offended the AAAS, but the response would have been different in Europe. In France, neo-Darwinian evolution may be seen as extended beyond evidence because the evidence is interpreted differently due to an evolution-critical history. To which culture does one look for a counter-trend? Disregarding subcultures creates unnecessary problems. How would proof #3 apply in a predominantly P/progressionist culture? Can one argue that popular culture provides both a haven for the P/progressionism eradicated from professional biology and a non-Progressionist counter-trend? Obviously, there are non-Progressionist counter-trends in a culture dominated by P/progress, but this is why the author needs to demonstrate that a *particular* trend *functions* as an alternative against which a particular biologist holds his or her Progress-driven extension of theory beyond evidence. It is not enough to establish the mere availability of counter-trends because that tells nothing about their acceptability to a particular biologist.

This requirement of a functional and relevant counter-trend receives no attention. In applying proof #3 to Darwin we learn that his Malthusianism was held against critics (165-66) and that he rejected environmental and social factors proposed by J. S. Mill as an explanation for racial and sexual differences (168). Cope was a Lamarckist against non-Lamarckian options (264), Dobzhansky held the balance theory against the classical theory (400), Maynard Smith adopted group selection against his earlier individual selectionism (481), Wright worked long among colleagues at the University of Chicago to whom genetics was a side issue to the fundamental problem of development (402-403), and Wilson and Lewontin engaged in mutual critique of each others forms of progressionism. If these examples are intended as cultural counter-trends, they fail because they involve rival theories within biological and cultural progressionism. In order to claim that theory extension is P/progress-driven, Ruse needs a trend against P/progress at the level of metaphysics or religion which is functional. This he does not provide.

One final problem with proof #3 concerns the metaphor of stretching a theory beyond evidence leaving an evidential gap. This leads to the confusing suggestion that the locus of action of non-epistemic values is in the gaps left by empirical evidence. The inadequacy of the metaphor is revealed by asking what might happen in the gap. It appears to have no specific content that might be affected by non-epistemic values. Perhaps the idea of P/progress shapes the interpretation of evidence or the assumption of fictional entities and processes, filling the gap with interpreted evidence or useful fictions. Perhaps the idea of P/progress informs the cognitive content of explanations and theories in science. The locus of action of the cultural value is, then, in the cognitive content of biological theory itself. Ruse observes that “at the purely conceptual level, evolutionary thinking of the most professional or mature level is still pervaded by metaphors sympathetic to progress, such as ‘tree of life,’ ‘adaptive landscape,’ and ‘arms race.’ Removing phrases like these might make for epistemic purity, but doing so would also banish many epistemic virtues, like predictive fertility, and surely result in epistemic sterility” (539). If such metaphors can transform the idea of biological progress into specific working hypotheses, then the

cultural knowledge informs the knowledge of nature down to the specifics of concepts, theories and explanations.

Ruse's observation about the role of metaphor in evolutionary thought is crucial if one wants to determine whether the expulsion of cultural values from science is a necessary condition for its maturity. It implies that the maturing of science does not involve the wholesale replacement of cultural non-evidential values with epistemic values (see also 455). Unfortunately, these observations are an afterthought. Interesting glimpses on the role of metaphor are scattered throughout. However, Ruse does not use what is known about the metaphoric transfer of knowledge between culture and biology for the interpretation of the case studies. This leaves us with a tension. How can Ruse conclude that the maturing of evolutionary thought required the expulsion of the metaphysics of P/progress when he expects that P/progress will continue to be imported metaphorically into specific working hypotheses? The answer is that while P/progress continues to inform the cognitive content of evolutionary theory it does not entail the theory. Neither does evolutionary theory entail P/progress. P/progress and evolutionary thought are connected by interpretation (by cause is Ruse's term), not logically. As I see it, the role of P/progress in shaping theory may have been seen by some as a professional liability, but this is not a necessity because metaphor does not act logically, but creatively. In sum, logically speaking, science at any stage of maturation is free from metaphysics. However, metaphysics and religion are part of the context from which can originate ideas valuable for science, and in terms of which science can be interpreted. I conclude that the maturing of science involves, among others, the selective retention of those non-evidential values that are good for mature science and the clarification of this interpretative relationship.

This conclusion may also explain another finding of Ruse. If metaphysics and religion are among the forces that shape the growth of science, one would expect them to shape the professional values of scientists as well. Ruse suggests that assessments of the professionalism of one's science may depend on the intent of the practitioners (11), but left this idea undeveloped. This leaves me with a question.

According to Ruse, since the middle of the nineteenth century, the likes of Agassiz, J. Huxley, Fisher, Dobzhansky, Gould, Lewontin and Wilson allowed their metaphysics or religion to shape their biology against the proposed trend of expelling them from science. In Agassiz's case this did not prevent the Lawrence Scientific School at Harvard, led by him, from producing ten B. Sc. degrees a year between 1851 and 1871 -- a sure sign of professional recognition (Morrell, 1990: 984). In the late 1910s and 1920s, a group of prominent American biologists including Lillie, W.M. Wheeler, W.E. Ritter and L.J. Henderson joined H.S. Jennings's effort to set out the nature and boundaries of a unified autonomous science of biology in terms of the concepts of holism and biological organization (Pauly, 1988: 142). This was a communal attempt to state in explicit metaphysical terms *what* biology was. Such examples can undoubtedly be multiplied. How is this to be explained? Did they fail to be concerned for a value-free biology because they understood that their metaphysics did not entail their biology? Did they believe that metaphysics and religion can play an internal role in mature science, that this is inevitable, perhaps even desirable; and that it is necessary to submit this role to public scrutiny so as to ensure that the metascience becomes science as Popper (1959: 38, 277-78) believed? That is, did they have a different 'professional style' (the term is Nyhart's, 1995: 275)? *Monad to Man* is very thin on this question (6) and readers shall have to look elsewhere for an answer. The only things we learn is that Julian Huxley "saw no theoretical reason why a mature science should not (in principle) be molded by a cultural norm" (351), and that Lewontin does his biology explicitly in the light of Marxist philosophy (520).

While a discipline is defined by what is studied, the style of a professional is a loose set of values that guide how work ought to be performed. In biology, professional values have included or still include intellectual breadth, innovation, methodological atheism, methodological naturalism, conception of nature, aims of science, intellectual openness and modesty (Nyhart, 1995: 86, 188, 356-9). More attention to the history of professional values in biology would have been of benefit in *Monad to Man*. First, professional values vary with context including the intent of the practitioners (Rainger *et al.*, 1988: 6),

country, institution, generation, style of thought, and discipline (Harwood, 1993, Nyhart, 1995). Such complexity makes a simple progressive elimination of (P)progress from evolutionary thought unlikely. For instance, before World War II, the majority of American biologists had a pragmatic style of thought as opposed to the comprehensive one in Germany (Harwood, 1993). This is important for Ruse's claim. Not only does a comprehensive style of thought invite metaphysics as a legitimate partner in science, but this is a period in German history of biology not covered in *Monad to Man* for reasons of space (180-81). Thus it may be a over-simplification to portray the relationship between professionalism and P/progress in biology as inversely proportional. Second, that professional standards should depend on the discipline is not surprising. The way an object of study is conceived tends to shape how it is studied and often involves metaphysical conceptions of nature. Thus one can see how disciplinary and metaphysical values may act in tandem to produce a professional style. For instance in the early 1860's in Germany, "philosophical differences over the study of life were increasingly being channeled along disciplinary lines," (Nyhart, 1995: 105) and came to be expressed in the style of professional writing (Nyhart, 1995: 63). In one example, the idea of progress became a legitimate part of professional biology by being naturalized. The German paleontologist and systematic biologist Heinrich Georg Bronn (1800-1862) held a view of nature ruled by a law of progressive development. This law was conceived of as a *physical* vital force analogous to the force of gravity. He explained embryonic as well as evolutionary development as driven by this physical vital force, but excluded references to divine causes (Nyhart, 1995: 112-14). Von Baer and Driesch held similar teleological, but non-interventionist views spanning the entire nineteenth century between them while Roux excluded both metaphysical and divine causes from scientific explanation. Thus, shifting conceptions of nature translate into fluid disciplinary boundaries as well as fluid professional values. Therefore, I would expect the role of P/progress in evolutionary thought to be unsystematic rather than gradually diminishing much along the lines of the role of mechanical explanation in the four orientations within nineteenth-century German morphology distinguished by

Nyhart (1995).

This expectation is reinforced by the opposing professional values that have shaped the evolutionary synthesis in America. One aim of “the architects of the synthesis” was to have a biology independent of physics. This was satisfied by the metaphysics of P/progress. The opposing aim was to have an evolutionary biology respected as a professional science. This required the exclusion of metaphysics (see Smocovitis, 1996: 145-153). I would expect a range of positions on the role of P/progress depending on the success of the delicate balancing act this situation requires. However, Ruse concludes that the desire to be seen as professional scientists was the main reason for the gradual expulsion of the idea of P/progress from evolutionary thought. I suggest a different interpretation. First, there are enough exceptions to this putative progressive purification of biology from P/progress. Second, professional style in biology has included metaphysical values, even the value of P/progress. Thirdly, the professional status of evolutionary biology is not necessarily threatened by P/progress because the latter does not entail the content of the former. Fourthly, if scientific progress depends on the use of metaphor, freedom from metaphysics may be an undesirable professional standard for any science. Finally, if cognition is metaphorical an engagement of science and metaphysics may be inevitable. As I see it, metaphysical purity is a professional value that slows the growth of knowledge. Some of the characters in Ruse’s historical drama may have held this view and may have felt their evolutionary thought was perfectly professional. So why does Ruse assume that everyone’s paradigm of professionalism excludes metaphysical values?

The story about the professionalization of evolutionary biology is also a story about Ruse’s own standards of professionalism. The question of Ruse’s professional values needs to be raised because it sheds light on the tension between the unsystematic historical record presented in *Monad to Man* and his Progressivist interpretation of it. For Ruse, the history of society and culture are functions of biological evolution. He also believes that the way things have developed is how they ought to be (Ruse, 1995: 257-

91). Naturally, he has no objection to using the past to justify the present, i.e., to present a history of progressive liberation from Progress. Since this has come to be seen as unprofessional Whig history, he allows only that answers to the present are to be found in (not justified by) the past (4, 541n1). Has he succeeded? As for the role of P/progress in evolutionary thought (proof #1), Ruse has described what he observed. The overall pattern of the history of the engagement of P/progress and evolutionary thought is checkered. P/progress shaped the evolutionary biology of some biologists while for others it was irrelevant both within and without science. Ruse explains this by pointing out that P/progress and evolutionary theory are logically disconnected. I take these observations as signs that his historiography has not been informed by his evolutionary naturalism (proof #2). Further, by alerting his readers to this possibility, Ruse obliges himself to satisfy their demand for an unbiased description on pain of losing their confidence. This is as good a safeguard against naturalism as one could expect from a committed naturalist. However, as an evolutionist, he has gone beyond the checkered record by interpreting it as a progressive liberation from the fetters of metaphysics and religion of Progress (proof #1). Thus, on the one hand Ruse advocates and applies the professional value of working descriptively (5). On the other hand he interprets the record from the perspective of progress in nature and culture. Hence the tension. As with some of the evolutionary biologists presented, the professional style of Ruse the philosopher includes values of a metaphysical or even quasi-religious kind. This is surprising given his ideal to take value-free science as a model for his philosophy (Ruse, 1995: 4, 160-62, 1996: 5) and his declared non-Progressionism (Ruse, 1995: 251).

Let me conclude by applying proof #3 to Ruse's theory that evolutionary biology has gradually matured by casting out the metaphysics of P/progress. This theory goes beyond the evidence. Not only is the application of proof #3 not convincing, but the historical record can be interpreted non-progressively. Is there a cultural trend opposing Ruse's P/progressivist extrapolation that would reveal his metaphysical motivation? As it happens, the 1993 annual meeting of the AAAS provides just the functional counter-

trend required. Most practicing scientists value scientific objectivity and believe this excludes Ruse's claim that evolutionary thought continues to be shaped by the metaphysics of Progress. This counter-trend is also functional. Michael Ruse had been asked to refute Phillip Johnson's argument that evolutionary thought is constituted as much by philosophical naturalism as by scientific evidence. Instead he agreed with Johnson. However, Ruse is not a creationist as proof #3 might suggest had there been no evidence of his Darwinism (proof #2). So what does this reveal about Ruse's metaphysical commitment as to whether or not historiography ought to be free of metaphysics? As far as I can see, his description of the record is free of the metaphysics of Progress. We learn that P/progress informs the evolutionary thought of some, but not of others. His interpretation of the record, however, is unabashedly Progressivist. Revealing the metaphysical origin of evolutionary thought, he went against the grain of the AAAS membership, but kept his commitment to P/progress with integrity and courage.

Did the AAAS members have reason to be upset? Yes and no! No, because, after all, the links between metaphysics and science are not of the logical kind. The description of evolution does not mandate P/progress, but it can be interpreted that way. Progress is in the eye of the beholder. Yes, because "Those (like philosophers) whose business is logic and argument are too prone to neglect the fact that there can be very important tendencies and plausibilities among ideas which are less than strict entailment, but which are highly influential upon thought, and are not simply exorcized by pointing out that they are not logically conclusive. We should look very carefully at such tendencies to see how far we ought to be pushed for good reasons to accept them, and how far we ought to resist them." (Hesse, 1985: 108). *Monad to Man* is a pleasure to read. One can't help, but smile at the occasional 'Ruse.' Who else could portray female dung flies as "archetypical Victorian maidens?"

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