How Not to Reconcile Evolution and Creation

Alexander R. Pruss

March 8, 2006

1. Introduction

It is widely accepted that divine creation of human beings is compatible with evolutionary theory, except perhaps in regard of the human soul, and that neo-Darwinian evolutionary theory provides an explanation of speciation and of complex features of organisms that undercuts Paley-style teleological arguments, whether or not the evolutionary mechanisms are truly random or deterministic. I will argue that a plausible understanding of the doctrine of creation of human beings is either logically or rationally incompatible with full evolutionary theory, even if one does not take souls into account. Consequently, a theist needs to move to a weaker version either of the creation doctrine or of evolutionary theory, or both.

The tension between creation and evolution is structurally analogous to that between grace and free will. In both cases, a theist would like to attribute certain events to God *and* to finite causes. One might, thus, think that there is nothing more to be said about the case of creation and evolution besides what has been argued at length about grace and free will. The same solutions have obvious analogues in the case of creation and evolution. I shall argue, however, that these analogous solutions face disanalogous problems, largely due to the statistical nature of neo-Darwinian theory.

I will begin by quickly sketching plausible creation and evolution doctrines. Then I will divide up the plausible ways of reconciling the two, and argue that all but one fall prey to logical problems, while that one falls prey to empirical improbability.

I will end by sketching several ways out that proceed by weakening one or the other of the doctrines in tensions. For instance, one of these accounts makes exactly the same first order *causal* claims as deterministic evolutionary theory but omits some of its *explanatory* claims.

2. Neo-Darwinian evolution

By the term "the human species" I shall rigidly designate our species. Our species exists in some but not all possible worlds. Any species that is genetically identical to ours I shall call "*a* human species". (For precision, one should speak of "a *homo sapiens* species", but that would be awkward.) The notion of genetic identity of species here needs to be explicated in terms of the qualitative similarity of the genetic codes in the species. One way to do this would be to say that species *A* and *B* are genetically identical if for any possible member of either species, there is a possible member of the other species who would have the same genetic code. Another way would be to say that any genetic sequence that would count as within the statistically normal range for one of the species would count as within the statistically normal range for the other species. The exact details of the definition will not matter for the argument. Note that it is logically possible, though probably unlikely, that very different evolutionary processes might give rise to genetically identical species.

The reason for introducing the notion of "*a* human species" is to avoid issues raised by Kripkean considerations and by biological definitions of species that allow for genetically identical but nonetheless distinct species. Also observe that even if non-emergent dualism is true, a human species could arise through purely naturalistic processes—its members would be zombies, then. Another advantage of speaking of *a* human species, thus, is that the concept side-steps questions of dualism that arise for *the* human species.

Now, neo-Darwinian evolutionary theory may not offer us an explanation of why precisely a human species exists, but it offers us explanations of why a species exists with the various notable complex features of a human species, such as intelligence (understood thinly enough not to imply anything non-naturalistic), manual dexterity and vision. In offering these explanations, the theory undercuts Paley-style teleological arguments for the existence of God based on the existence of these "notable" phenotypic features. I shall call these the "ambitious" explanatory claims of evolutionary theory. While evolutionary theory does much more for us than provide the ambitious explanations, it is this important aspect of the theory that has captured the popular imagination.

A crucial assumption I shall make is that in neo-Darwinian evolutionary theory the ambitious explanations are statistical in nature. They are, thus, more like the explanations in statistical

thermodynamics than in Newtonian celestial mechanics. Evolutionary explanations do not simply state initial conditions and give laws which together entail the obtaining of the explanandum. Rather, they sketch an evolutionary scenario that includes a number of mutation events as well as claims that these mutation events led to organisms with phenotypes such as to have promoted the passing on of the mutated genotypes. A crucial part of the story is that the mutation events are not predicted from the laws and initial conditions, but it is claimed that some set of mutations and environmental interactions that would lead to the occurrence of a species containing the "notable" features (under a sufficiently general description like "intelligence" or "acute vision") is not unlikely.

The "not unlikely" part is essential to the ambitious explanations that undercut Paley-style teleological arguments. For if the sequence of events leading up to, say, intelligence were astronomically unlikely—the sort of thing extremely unlikely over the lifetime of the universe to occur anywhere in the universe—then a teleological argument based on the existence of intelligence would have more than a fighting chance. No one would we be impressed if a biologist simply noted that an astronomically unlikely coincidence of random mutation events could make an utterly non-intelligent animal instantly have an intelligent offspring. Such an observation would not require the genius that the theory of natural selection required, and would do little against Paley-type argumentation.

That is why evolutionary theorists emphasize the great amount of time that was available for evolution and the large number of organisms in which random mutation occurs. For instance, Darwin writes about the evolution of the eye that

> We must suppose each new state of the instrument to be multiplied by the million; each to be preserved until a better one is produced, and then the old ones to be all destroyed. In living bodies, variation will cause the slight alterations, generation will multiply them almost infinitely, and natural selection will pick out with unerring skill each improvement. Let this process go on for millions of years; and during each year on millions of individuals of many kinds; and may we not believe that a living optical instrument might thus be formed as superior to one of glass, as the works of the Creator are to those of man?[1]

It is precisely the genius of Darwin to have realized that random variation over millions of years in millions of organisms is not unlikely to produce very new phenotypes and that the better of these will be selected for. Without this amount of time and without the number of organisms involved, the probabilities of the emergence of something as complex like the eye would have been astronomically small, and hence the ambitious explanatory goals would not have been met.

Or take Dawkins' claim:

> We have seen that living things are too improbable and too beautifully 'designed' to have come into existence by chance. How, then, did they come into existence? The answer, Darwin's answer, is by gradual, step-by-step transformations from simple beginnings, from primordial entities sufficiently simple to have come into existence by chance. Each successive change in the gradual evolutionary process was simple enough, *relative to its predecessor*, to have arisen by chance.[2]

The probabilistic explainability of the successive steps, if not of the sequence as a whole, seems to be crucial here.

The ambitious explanations that undercut design arguments are in part statistical. They imply that given certain initial conditions, certain developments are not unlikely. What exactly the force of the "not unlikely" is will differ from evolutionary story to evolutionary story, depending on how well developed the genetic model of the story is. The neo-Darwinian evolutionary stories that I am interested in, thus, are essentially statistical. This does not mean that they involves genuine *randomness*, of course. Classical statistical thermodynamics was a statistical but *deterministic* theory, and while philosophers of science differ on *how* to make that theory work, it is plausible that it could be made to work.

Furthermore, I shall assume not only that neo-Darwinian evolution gives a statistical explanation of the notable features of a human species, but also that it yields purely naturalistic causal chains from a primitive, unicellular organism to the first member of the human species (and any other human species there might be).

I need one final assumption about neo-Darwinian evolution. I shall assume that either there is only one universe, or we are seeking to explain why the notable features of a human species evolved in *this* universe. If we assumed infinitely many universes and merely wanted an explanation why a human species evolved somewhere, we would not need natural selection at all—probably in some universe a human species would arise out of a dog species through an extremely improbable coincidence of mutations—and the genius of Darwin is not needed for the ambitious explanatory claims.

3. The creation doctrine

I will need to elucidate the creation doctrine. I shall take it to be the claim that God intentionally brought it about, immediately or mediately, that a human species exists, and did so in such a way that the design of that human species can be attributed to that intention, in the way that the design of an artifact can be attributed to the craftsman, to borrow the analogy in Isaiah 64:8 and Romans 9:21. This implies that the

existence of a species having the mental and physical features of the human species is explained by God's intentional activity. Moreover, I shall make it be a part of the doctrine that God intended the human species to exist in *this* universe or else that God created only one universe.

The creation doctrine is quite compatible with the existence of a naturalistic story about how human beings came into existence, at least if we leave aside considerations of the soul. God might have carefully arranged the initial conditions in such a way that eventually a human species would be determined to arise. The notion of creation thus does not beg the question against theistic evolutionary accounts. But this doctrine of creation is meant to rule out *some* alternative stories that are *prima facie* compatible with God's being the first cause of the universe. On one such story, God created an initial mix of stuff without any intention that the human species should arise from it. He then observed what arose, deterministically or not, and when human beings evolved, he, as it were, applauded. On this view God's creative activity would be a causally necessary condition for the existence of human beings, but he would have intentionally caused human beings to exist.

Nor is the doctrine of creation as I understand it compatible with the idea that God produced an evolutionary process merely intending that it would lead to some interesting result or other, and then when he saw that the interesting effect would in fact be the arising of something like human beings, he put only some minor finishing touches on their bodies, say miraculously intervening to make them hairless, as this does not make God the *author* of the notable features.

4. A survey of options

We can now divide up the field of reconciliations. Either God deterministically, mediately or immediately, caused the notable features of a human species, or he did so indeterministically. The most plausible *mediate* deterministic account is simply one where the evolutionary story about the human species is deterministic and God chooses the initial conditions in such a way that a human species should result. This is like some varieties of Calvinism. The main *immediate* deterministic account is a Thomistic one, on which the evolutionary processes are indeterministic, but God makes use of his ability to engage in "primary causation" to determine the results, while the results nonetheless are indeterministically caused via second causation by finite causes.

Indeterministic accounts can be divided up depending on whether God made use of generalized middle knowledge to set initial conditions that would lead to the notable features being exemplified. Here, generalized middle knowledge (GMK) is the non-trivial knowledge of conditionals whose consequent reports events that are the consequences of indeterministic processes with initial conditions specified in the antecedents. Thus, if a toss of a coin were indeterministic, an example of generalized middle knowledge would be the knowledge that if one tossed the coin with a certain velocity at a certain time, the coin would land heads—even though it is nomically possible for a toss with that velocity to result in tails. The special case of generalized middle knowledge where the processes are free creaturely decisions is the *scientia media* of the Molinists.

If God could make use of GMK, then we have a relatively simple account: as in the mediate deterministic case, God chose the initial conditions so as to produce a particular result. Unlike in the deterministic case, the initial conditions are not nomically certain to produce that result, but God made use of GMK to know that they would produce it.

It will turn out that none of the views so far mentioned are logically compatible with the conjunction of neo-Darwinian evolution and the creation doctrine. The final view does a little better. On this view the processes are indeterministic, and God does not make use of GMK (maybe because he does not have it, or maybe he has it but does not or cannot use it for this purpose). Instead, God has to make use of probabilistic calculations to produce initial conditions *likely* to lead to the outcome he intends, while being ready to miraculously intervene should things go awry. The evolutionary theory that I have defined earlier entails in its naturalism that no such interventions in fact happened in the development of any human species. It will turn out that this account fails not on logical grounds, but simply because it is extremely unlikely that no intervention would have been required.

5. Mediate determinism

Assume that God set the initial conditions which deterministically led to the development of the human species. The problem now is not just that the creation doctrine purports to provide one explanation of an event (say, the arising of intelligent life) while the evolutionary theory purports to provide another. For a given event can have more than one explanation: “Fred died because his heart stopped beating. It is

also true that Fred died because he was shot to death." Rather, the problem will be that the creation claim, if true, would undercut the *statistical* explanations that evolutionary theory makes use of.

To see this, suppose that Fred has dropped, one by one, a thousand coins from a high building, and 485 of them landed heads. We may now wonder: "Why was the percentage that landed heads between 45% and 55%?" There is a simple statistical explanation here, it seems:

(1) The probability that between 450 and 550 of the coins would land heads-up is about 99.9%, and this is why somewhere between 45% and 55% of the coins landed heads.

But suppose now we learn a further fact. Fred had calculated at what angle and velocity he would have to drop every single coin in order that the coin should land heads and the angle and velocity needed for tails. Then he carefully chose the angles and velocities so as to guarantee that between 45% and 55% of the coins would land heads-up. I submit that this extra fact falsifies (1). It falsifies (1) not by falsifying the probabilistic claim made, since that clam is nonetheless true.

What is now seen to be false is the claim that this probabilistic fact *explains* the result. For it no longer does. The reason is that the probability stated in (1) is no longer conditioned on the *relevant* background conditions, since now a part of the relevant background condition is that Fred tossed the coins in such a way as to ensure that between 45% and 55% of them would land heads-up. The conditional probability conditioned on this piece of background knowledge is 100%, not 99.9%, and it is *this* conditional probability that is explanatory of the result.

A statistical explanation of the sort I am interested in claims that some event E is explained by the occurrence of circumstances C such that $P(E|C)$ is not very low. The circumstances C need to be relevant. There are multiple theories of relevance, all of which have their difficulties. Nonetheless, we can be confident in some case-by-case judgments, such as my above judgment that when Fred is skillfully tossing the coins, the circumstances that do not include Fred's skill and intentions are not the relevant ones.

We can formulate a plausible general principle: Facts about the intentional activity of agents working to set the initial conditions so as to produce or prevent the effect E are relevant background information and the failure to include them in the background information relative to which conditional probabilities are computed vitiates the claim that these probabilities are explanatory of E. In particular, if the initial conditions are deliberately chosen by an intelligent agent in such a way as to guarantee the

occurrence of *E*, then any attempt at probabilistic explanation that does not in some way involve the intelligent agent is a failure: the claim that an explanation is provided is simply false. If I know just at what velocity to pull the lever on a slot machine to win at least a small amount, then I do not win by chance, and the probabilistic explanation of a small win in terms of its not being unlikely is incorrect.

Of course if one did not have sufficient reason to believe in an intelligent agent at work here, then one might well have reason to believe that an explanation is provided, but then this would be a case of false justified belief.

Thus, if God definitively intended to produce some animal or feature of an animal, then a naturalistic statistical evolutionary explanation of the existence of the animal or feature is incorrect if the processes behind the evolutionary processes are really deterministic. For the probability that such-and-such a feature would arise relative to background information that does not specify the possibility of the initial conditions being arranged by God is explanatorily irrelevant in this case. Hence, it is logically inconsistent to accept neo-Darwinian theory, the creation doctrine and mediate determinism.

5. Generalized Middle Knowledge

According to the controversial position of the Molinist, God has *middle knowledge* of what a person *would* freely do were she created and placed in circumstances *C* that specify in as great a detail as possible everything that happens before the person's decision. Similarly, one might think that God has generalized middle knowledge of how a random process would turn out were it allowed to run. Thus, given an indeterministic coin flipping experiment described exhaustively under description *D*, God knows whether the coin would land heads up or whether it would land tails up were an experiment satisfying *D* actually executed.[3]

Now, if God has generalized middle knowledge and can make use of it while creating (a separate assumption!), then God knows what any given set of initial conditions *would* result in. Presumably, then, he would be choosing the initial state in such a way as to guarantee the existence of the animals or features that he intends to produce. But then this intentional act of God's is again a piece of background knowledge that would undercut the evolutionary explanation.

Our intuitions are weaker here because we are not used to the idea of middle knowledge or generalized middle knowledge in our daily lives. But suppose now that Fred has generalized middle

knowledge of the outcomes of indeterministic coin tosses. An indeterministic coin toss presumably involves the coin's path being subject to indeterministic processes, though also affected by the initial conditions. Fred now knows that there is a set of initial conditions that *would* result in 45%-55% of the coins landing heads-up, and he knows *which* sets of initial conditions are such. He chooses one of them. I think it is still true that the statistical explanation of the result is incorrect. It is incorrect because the information about Fred's knowledge and intentions is clearly relevant, and the purported statistical explanation is then based on background information that fails the test of saliency.

Consider a simpler case. Suppose that Fred goes to a casino and knows, e.g., because God told him, which ones of the slot machines would hand him a win when played at what time. He chooses one of these and plays. Let us suppose on physical principles there is a 30% chance of winning. It is surely incorrect to say that there is a statistical explanation of his winning in terms of the probability being not very low. Rather, Fred wins precisely because he picks a slot machine that he knows *would* give him victory. Fred does *not* win by chance. The 30% chance is explanatorily and predictively irrelevant: Fred will be able to win over and over until the bouncers come. Or, if he chooses, he will be able to win exactly 30% of the time—but not by chance.

In the deterministic case, we employed the principle that the choices of agents who are tweaking initial conditions so as to bring about an outcome are always relevant to a statistical explanation of the outcome. The same principle applies now. A putative explanation that leaves out these facts is not a correct explanation, since it lacks information necessary for the specification of the relevant initial conditions.

There is another way of seeing the difficulty for both the Molinist and the determinist accounts. Suppose that Bob has a supernatural GMK faculty and tosses a sequence of indeterministic and fair coins. It is plausible that for each coin there are some initial velocities which Bob foresees would indeterministically result in heads and some that he indeterministically foresees would result in tails. If Bob chooses the initial velocities so as to produce some particular pattern of results, then the fact that the laws of physics prescribe a probability 1/2 to heads and a probability 1/2 to tails is of no direct predictive or explanatory value here. What is relevant is Bob's choice.

Bob might, of course, deliberately choose to produce a pattern that looks like one that would result from a stochastic process with independent flips that have probability 1/2 of yielding either outcome. If he so chose, then *as it happens* the physical probabilities would yield the right prediction. But even so, the naturalistic statistical explanation of the outcome would be incorrect, because it would not be directly because of the physical causation's probabilities that the outcome would occur, but only because of Bob's choice to simulate what these probabilities would predict. The explanation essentially includes Bob: because the physical probabilities are such and such, Bob chooses initial velocities that would produce a pattern that would fit with these probabilities, and hence such a pattern obtains. An *intervening* agential cause must be mentioned in an explanation.

7. Thomism

The theistically determinist Thomist claims that there are two analogous kinds of modality. Secondary causality is what we see all around us—it is the causality of moved movers, of the things around us and including us. God, however, exercises primary causality. Each instance of secondary causality depends on an instance of primary causality and occurs because of the primary causality. There is no "competition" between the two kinds of causality, but on the contrary there would be no secondary causality without primary causality. When Jones freely mows the lawn, his free causation of the lawn's being mowed is made possible by God's primary causality. God uses primary causality to determine which of the possible actions Jones does, but at the same time Jones indeterministically causes the action that he is held responsible for. Prior natural conditions are insufficient to determine Jones to mow the lawn, but once God's will comes into the picture, then Jones *is* determined to mow the lawn.

It would be question-begging to object that the primary divine causality destroys the freedom of the secondary causes. Our Thomist will claim that free will requires freedom only on the level of secondary causation. Whether this is a satisfactory account of the interaction of grace and free will is controversial. But I shall argue that even if it is, it does not yield a satisfactory account of creation and evolution.

We have already discussed the case of evolution being deterministic on the physical level. We may thus now assume that the processes are genuinely stochastic on the level of finite causes, but God's primary causality determines the particular outcome he desires, namely a sequence of events leading to the existence of a human species.

There are two kinds of problems with this view. First of all, this view seems subject to difficulties similar to those that plagued the physically determinist and Molinist accounts. If an agent's choosing the initial conditions so that they would stochastically or deterministically lead to a particular outcome vitiates a statistical explanation of the outcome, surely *a fortiori* the agent's ensuring that a set of initial conditions *does* lead to that outcome would also vitiate the statistical explanation. If someone intentionally determined that the number of coins that landed heads would be between 45% and 55% of the total, then it seems quite incorrect to give a statistical explanation of the outcome, and for this intuition it does not seem to matter whether the determination is on the level of secondary or primary causality.

The Thomist will, however, insist that in saying this I am not giving due consideration to the difference between secondary or primary causality, and that my intuition falsely generalizes from secondary causation cases to that of primary causation. This response does not seem entirely satisfactory unless expanded into an account of how that difference matters for the intuition, but instead of this approach, I shall point out a second kind of problem.

Start with the following simple argument. Consider a stochastic process that can produce one of two outcomes, A and B, with specific probabilities, say, 1/3 and 2/3 respectively. According to the proposed Thomistic account, of metaphysical necessity, the process results in A if and only if God chooses to primarily cause it to result in A. The metaphysical necessity here is due to the fact that secondary causality metaphysically depends on primary causality. Now, if we have two events such that it is metaphysically necessary that one should occur if and only if the other does, then the two events have the same probability, when conditioned on the same conditions. Consequently, given that God chooses to have the stochastic process run at all, the probability that he chooses to cause the stochastic process to result in A is 1/3. But it seems contrary to God's independence that numerical probabilities be assignable to his choices.

If this argument is sound, then the primary and secondary causation account is incompatible with the kinds of stochastic processes where numerical probabilities can be assigned. But it is these kinds of stochastic processes that evolutionary theory presupposes.

There is another way of seeing a difficulty here even if we allow the assignment of probabilities to divine choices. God chooses the outcome of an indeterministic process depending on how well the

outcome fits with his providential plan. It thus follows from the secondary and primary causation account that the likelihood that an outcome of the process fits with God's providential process is equal to the physical probability of the event. It seems *prima facie* quite unlikely that the probability of a mutation should be equal to the probability of that the mutation is providential.

Indeed, it seems difficult to reconcile this with the crucial assumption in evolutionary theory that the probability of a mutation is independent of adaptiveness, since God's providential plan presumably strong favors at least *some* adaptive features, such as intelligence, and hence the probability that an intelligence-increasing mutation should be prudential is greater than the probability that an intelligence-decreasing mutation should be prudential.

8. The indeterministic, no generalized middle knowledge account and no divine determination

What if, on the other hand, God lacks generalized middle knowledge or is not able to make use of it while creating? It turns out that it still is possible for God to intentionally guarantee the existence of the desired features of the universe without undercutting statistical explanations. To do that, God can first set up initial conditions in such a way as would make the statistical explanations provided by evolutionary theory correct. Since God does not know, or cannot make use of the knowledge which initial conditions would result in which outcomes, he can do all this. God can ensure that the background conditions in the evolutionary statistical explanations are indeed the relevant ones.

Of course, this does not guarantee that the outcome God intends should occur. But we can now follow a modified version of a suggestion by Del Ratsch[4]. God *intended* that certain things should be generated. To that end, he set up processes that would be likely to lead to them, with the probabilities predicted by an ideal naturalistic evolutionary theory. In order to go from likelihood to certainty, however, God planned that should something go wrong, he would intervene and thereby ensure the desired result. It would be not unlikely that a human species would evolve, but if they didn't, God would miraculously intervene. A little bit of thought shows that without either mediate or immediate determination, without GMK and without miraculous intervention, God can only watch and hope the right result would come out.

This account is logically possible, and hence indeterministic evolutionary theory is logically compatible with a creation doctrine and the denial of GMK. But nonetheless, as we shall now see, this

conjunction of views is quite unlikely. The reason for this is the extremely low probability that precisely a human species would evolutionary arise. Stephen Gould writes:

> A historical explanation does not rest on direct deductions from laws of nature, but on an unpredictable set of antecedent states, where any major change in any step of the sequence would have altered the final result. This final result is therefore dependent, or contingent, on everything that came before—the uneraseable and determining signature of history.[5]

If one could turn back the clock, it would be likely that *other* solutions to evolutionary problems would arise, and in particular it is extremely unlikely that a human species (even considered only in respect of the body and not the soul) should be exemplified. Indeed, intuitively, given the complexity of the human genome, it seems that it was extremely unlikely that the initial conditions would have indeterministically given rise *precisely* to a human species. It may not be that unlikely that a species *like* the human one should arise, but that one that is genetically identical to it should arise seems quite unlikely.

Yet according to the creation doctrine, it is precisely a human species that God intentionally designs and creates. On this account, that the desired result should come about naturalistically, i.e., without divine intervention, is extremely unlikely. God would have to be very lucky. This theory, thus, presupposes that an extremely unlikely thing took place. It would be much likely that somewhere along the line God would have intervened. Some of these interventions might well have been so minor as not to leave a trace in the fossil record. Once we assume that God was waiting around to see whether he needs to intervene, and once we see that more likely than not he would have had to intervene, we have very little reason to accept the theory that God turned out to be lucky and never intervened.

9. Ways out

The physically deterministic and generalized middle knowledge accounts of the creation doctrine turned out to be logically incompatible with the ambitious explanatory claims of neo-Darwinian theory. The Thomistic account is probably likewise incompatible and implausibly allows probabilities to be attribute to divine choices. The remaining account depends on God's being very lucky, a luck we have no reason to believe in.

It appears that the only remaining solutions are to weaken evolutionary theory or to weaken the creation doctrine or both. I will quickly sketch four ways of doing this.

(1) We could weaken the creation doctrine. Instead of holding that God designed the human species, we can hold that God merely intended that some species of intelligent bipeds or other should have

arisen. If Simon Conway Morris is right, then the probability that some such species would have arisen is high. Thus, we could take the account on which God sits back and watches evolution indeterministically proceed after he has set up the initial conditions, and no longer have the embarrassment of having to think that God had to be very lucky not to have to intervene.

(2) Alternately, we could drop the assumption of all this taking place in a single universe. This would raise the probability that a human species would arise somewhere or other, and once again allow God to sit back and watch the evolution, without having to have much luck. Of course once one allows many-universes theories, one no longer needs neo-Darwinian theory at all to give a naturalistic explanation of, say, the existence of intelligent beings. The genius of Darwin is unnecessary for the ambitious explanatory claims.

(3) Alternately, we could accept the full creation doctrine and assume that evolution is indeterministic, but weaken evolutionary theory considerably. On this option, one could say that God would intervene whenever the natural process did not go in the direction that he intended, but no longer, as before, insist that such interventions never happen. Thus, evolutionary processes would be held to happen in between divine interventions. These interventions might be held to be subtle if one believes that God intervenes primarily "behind the scenes", but nonetheless would be the sort of thing that in principle would be empirically detectable as a gap in natural causation, though perhaps in practice they would not be detected.

(4) There is, however, an approach that only weakens evolutionary theory so slightly that it yields exactly the same empirical predictions as evolutionary theory does. To do this, we adopt the physically deterministic or Molinist solution, but drop the neo-Darwinian's claim that the statistical facts are explanatory of the notable features of the human species. The argument against the physically deterministic and Molinist approaches is compatible with the truth of all the categorical and statistical claims of evolutionary theory, but was not compatible with the higher level claim that the statistical facts are *explanatory* of the features. This weaker version of evolutionary theory agrees perfectly with all the predictions of standard neo-Darwinian theory, and indeed with all first order claims about what mutations happened and when, what creatures reproduced and when, and so on. It is compatible with the existence of a chain of naturalistic causes leading from a unicellular common ancestor to the human species. It is

simply incompatible with the claim that all of these facts provide a statistical explanation of various features such as intelligence in the human species.

Nonetheless, the weakened theory if true would still undercut Paley-style design arguments. Woodward has argued that instead of taking quantum mechanics to explain particular events, we should take it to explain why certain probabilistic facts. Likewise, one might take a weakened evolutionary theory to explain why the probability of the notable features of the human species arising is not improbable on naturalistic hypotheses and such-and-such laws of physics, without claiming that this statistical fact is explanatory of the human species arising. A problem with this approach is that this claim of evolutionary theory seems to be *a priori*. Nonetheless, if correct, this claim is sufficient to undercut Paley-style teleological arguments.

Interestingly, if one holds that claims of explanation belong to a meta-theory rather than to a scientific theory on its own, then this view would allow one to say that the scientific theory of evolution is entirely true. However, I believe that explanatory claims are part and parcel of a theory.

As I said, these options are not exhaustive. But they are, I think, representative of the ways in which one needs to weaken one or both of the claims in order to arrive at a solution. One cannot reconcile creation and evolution if they are understood in the strong way that I had presented them, plausible as that way is. A price must be paid.[6]

---

[1] *Origin of the Species*, 6th edition, London: John Murray, 1872, p. 146 (online version at http://pages.britishlibrary.net/charles.darwin/texts/origin_6th/origin6th_06.html).

[2] *The Blind Watchmaker*, London: Penguin, 1986, p. 43. Italics in original.

[3] As a strategy for making design compatible with evolution, this was discussed by Del Ratsch, "Design, Chance and Theistic Evolution" in *Mere Creation*, ed. William Dembski (Downers Grove: InterVarsity Press, 1998), pp. 303 ff.

[4] *Ibid*., p. 306.

[5] *Wonderful Life: The Burgess Shale and the Nature of History* (London: Penguin, 1991), p. 283.

[6] I would like to thank Wayne Davis, Richard Gale and the participants of the Philosophers in Jesuit Education meeting at the 2005 Eastern APA for discussion of these issues.