

Thomist or Tumblrist:

Comments on *The Compatibility of Evolution and Design* by E.V.R. Kojonen

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Abstract: This paper engages Kojonen's discussion of scientific explanation. Kojonen claims the best way to conceptualize the relationship between evolutionary explanations and explanation by design is through the proximate-ultimate distinction and the levels metaphor. However, these are not robust explanatory models but examples of how one might differentiate ambiguous *explananda* contained in why-questions. Disambiguating *explananda* is a helpful tool for determining when a situation calls for further explanation; however, on this picture, that some further explanation is needed does not, as proponents of design arguments assume, specify *design*. The question of whether design is a good explanation at all hinges on what precisely we want explained.

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I have fond memories from graduate school of crowding around a laptop with several members of my cohort to scroll through a tumblr page titled "WTF, Evolution?!" The tumblr presented photos of animals with bizarre looks and questionable functionality, along with comical narratives about what Evolution might have been thinking while piecing together such organisms. An example that may prove relevant to the discussion at hand is the Hoosier cavefish, which, despite descending from fish with eyes, has ceased to have eyes altogether, and instead has its anus on the top of its head just above its mouth.

Of course, this humorous tumblr was a kind of anti-design argument; in fact, a collection of the best posts was eventually published as a coffee table book titled *WTF, Evolution? A Theory of Unintelligible Design* (Grunbaum 2014). The point the tumblr makes is not a new one: whether the composition of nature suggests design or lack thereof may strongly hinge on which corner of the world you are investigating.

E.V.R. Kojonen's investigation in *The Compatibility of Evolution and Design* focuses on evidence of design in "biological teleology." Kojonen argues that even if we grant the truth of evolution, and its ability to explain some aspects of "biological teleology," the existence of evolution itself—or at least, the directional, form-governed evolution envisioned by Kojonen—points to design. Kojonen's book makes an interesting contribution to the literature on evolution and design by raising important questions about whether the structure of the biological world displays complexity designed for a purpose. After suggesting that it does, he goes on to argue that the scientific story of evolution itself calls for a divine explanation. Despite the title of the book, Kojonen does not want to argue for mere compatibility—that our knowledge of the process of evolution is compatible with design—but for the stronger claim that the evolutionary process is compatible with design *arguments*. For this, Kojonen must show that evolution makes design more likely than not (2021, sec. 1.2, 3.2). Before taking up the main argument of the book, however, I will discuss a few points about scientific explanation, as I suspect they will help clarify the strengths and weaknesses of Kojonen's argument.

Within philosophy of science, two traditions frequently surface in discussions about scientific explanation. First, philosophers of science tend to conceive of an explanation as having two parts: the *explanans*, which are the things that explain, and the *explanandum*, which is the thing to be explained. This terminology was popularized through Hempel's deductive nomological model of explanation; for Hempel, the *explanans* were the premises in a deductive argument for the *explanandum* (Hempel and Oppenheim 1948, 136). While the analogy between explanations and deductive arguments has been widely rejected among philosophers of science for a variety of reasons, the scaffolding of the view—the idea that explanations contain an *explanandum*, and *explanans*, and some special relation between them—persists. Most current accounts of explanation

in philosophy of science can be understood as attempts to define the relationship between the *explanans* and the *explanandum* and/or pick out what might count as acceptable *explanans*.

This brings me to the second tradition, which is distinguishing explanations according to their *explananda*. If explanation A is distinct from explanation B, that implies A and B have different *explananda*—they explain different things. One tacit background assumption is there cannot be two different, complete explanations for the same *explanandum*.ⁱⁱ This connects to another general assumption about the relationship between explanations and why-questions. A why-question is a call for an explanation, and a good explanation provides a suitable answer to a why-question. Of course, “suitable” here serves as a placeholder for further theoretical clarification, but the rough idea is that it’s important the *explanandum* extracted from the why-question is the right one. Kojonen discusses theories of contrastive explanations, which is one way of fleshing out this view. Contrastive accounts of explanation suggest an explanation “fits” if the *explanandum* is situated within the appropriate contrast class. For example, I might ask my partner “why did you make fish for dinner?” This is a call for an explanation, but it’s ambiguous what I am asking to be explained. We might clarify the *explanandum* by introducing different potential contrast classes, such as: (1) why did you make fish for dinner as opposed to not making dinner since you knew I had ordered pizza or (2) why did you make fish rather than chicken given that I left the chicken out to thaw or (3) why did you make fish rather than something more hospitable to our vegetarian dinner guests? In each of these cases, offering possible, contrastive answers helps disambiguate the different potential *explananda* that may be embedded within the why-question.

Kojonen discusses this understanding of explanations as answers to why-questions but quickly dismisses it in favor of what he calls the “spatial metaphor of levels of explanation” and the proximate-ultimate distinction (2021, 149). Roughly speaking, the levels metaphor is the assumption that reality can be analyzed at a variety of different levels and the “methods suitable for studying one

level may not fit all levels” (ibid.). The proximate-ultimate distinction was first coined by Ernst Mayr as a way of highlighting two distinct explanatory projects present in contemporary biology; proximate causal stories help us understand how a present-day organism operates, while ultimate causal stories use the theory of natural selection to explain why some particular trait evolved (1961, 1503). In my estimation, both the levels metaphor and the proximate-ultimate distinction exemplify cases where progress has been made by clarifying ambiguous why-questions. In the case of the proximate-ultimate distinction, one may need to separate the proximate and ultimate answers to a question such as “why does the heart pump blood?” Similarly, the levels metaphor suggests an explanatory question may have more than one *explanandum* depending on the level of analysis. However, rather than viewing these accounts as instances of analysis by *explanandum*, Kojonen offers them as preferred competitors to accounts of contrastive explanation, on the basis that “the levels metaphor and the proximate-ultimate distinction have the benefit of making the relationship between different explanations intuitively clear, since in these models it is clear that one explanation can be more fundamental and can stand behind the other one in the causal chain of events” (2021, 151).

I want to pause to consider Kojonen’s claims about these models of explanation, specifically that (i) they suggest one explanation is more fundamental and (ii) they posit one explanation “behind” the other in a causal chain of events. According to the levels metaphor, we ought to construe reality as stratified into multiple, independent explanatory layers, where the tools which work at one level may not be suitable for other levels. If that’s right, then it’s quite difficult to understand how “one explanation might stand behind another,” given that these explanations apply to autonomous levels of reality which may not use the same explanatory framework. Second, nothing in the levels metaphor suggests that one of the levels is “fundamental.” It is always possible that we might find

examples of “top-down” causation or “bottom-up” causation—assuming, of course, we figure out ways of describing how these very different levels of reality interact in the first place.

These problems are only amplified when we consider the proximate-ultimate distinction. Kojonen suggests that behind the proximate-ultimate distinction are, interestingly enough, two different questions: the proximate question of “How does the organism operate?” and the ultimate question of “Why/how did it come to operate in this way?” Kojonen further claims that in design arguments, evolution acts as the proximate cause while design is the ultimate cause that “works through evolution,” in a way that is “similar to St. Thomas’ primary causation and secondary causation” (2021, 149-150). However, the analogy Kojonen suggests is a far cry from the original proximate-ultimate distinction posited by Mayr; the most noticeable difference, perhaps, is that for Mayr, *ultimate causes are explicitly non-teleological*.

Mayr’s understanding of biological causation centers on the notion of DNA. For Mayr, DNA is a genetic code that is analogous to a computer program, and the life of an organism is seen as the execution and exploration of this program. Proximate causation, then, is the story of how this program operates in the life of a specific organism. However, biologists also study the question of how DNA codes come to have the programming that they do—a question whose biological answer is natural selection. On Mayr’s view, this distinction allows us to “solve” the problem of biological teleology once and for all.

Where, then, is it legitimate to speak of purpose and purposiveness in nature, and where is it not? To this question we can now give a firm and unambiguous answer. An individual who—to use the language of a computer—has been “programmed” can act purposefully. Historical processes, however, can *not* act purposefully...

It is now evident that the terms teleology and teleological have been applied to two entirely different sets of phenomena. On one hand is the production and perfecting throughout the history of the animal and plant kingdoms of ever-new programs and of ever-improved DNA codes of information. On the other hand there is the testing of these programs and the decoding of these codes throughout the lifetime of each individual. There is a fundamental difference between, on the one hand, end-directed behavioral activities or developmental processes of an individual or system, which

are controlled by a program, and, on the other hand, the steady improvement of genetic codes. This genetic improvement is evolutionary adaptation controlled by natural selection” (1961, 1503-1504).

Note that, on Mayr’s view, the ultimate cause is *not at all* like St. Thomas’ primary cause, given that the ultimate cause (here the analog to the primary cause, which for St. Thomas is God) *has no telos*. If that’s right, then proximate and ultimate causes on Mayr’s view interact *very differently* than proximate and ultimate causes on Kojonen’s view, especially given that in the former case the ultimate lacks a *telos*. In the non-teleological case, it is quite difficult to posit one cause as “fundamental” or “standing behind the other”; this difficulty leads Mayr to describe the two sorts of causes as describing “entirely different phenomena.” But if proximate and ultimate causes can vary so drastically in how they interact, then Kojonen’s claim that the distinction itself clarifies the relationship between different explanations turns out to be false.

Although neither the levels metaphor nor the proximate-ultimate distinction can specify the relation between explanations, I think we might draw out what Kojonen intended if we re-examine the cases he offers with special attention to the relevant *explananda*. Let us turn, then, to the two examples of level-shifting by Ratzsch and Koperski that Kojonen discusses.

In the first case, a woman is suspected of killing her uncle when he dies under suspicious circumstances, but it is later discovered his death was caused by an overdose of his medication.

According to Kojonen,

it may still be plausible to claim that the niece killed the uncle by mixing up his medication, so that the actions of an agent act as the distal or ultimate cause of death, working through the proximate natural cause...In such examples, it seems clear that the ascription of a natural cause to an event does not necessarily decrease the responsibility of the human agent for the event. Rather, the causal chain is transitive, transferring the responsibility back to the agent (2021, 150).

Though I agree that discovering the uncle died of an overdose leaves open the question of why the overdose occurred, I find it much harder to endorse the claim responsibility is transferred in a straightforward way through a “causal chain.” Consider an alternative case, in which the niece

switches out her uncle's medication with what she believes to be a higher dosage, such that taking what he perceives to be a normal amount in fact causes him to overdose. However, the medication given by the niece is *not*, it turns out, a higher dosage of the medication; it is an entirely different medication that was mislabeled by a pharmacist who was distracted by a large argument that broke out in the pharmacy while she was labeling medications. The mislabeled medication wouldn't have caused an overdose, except that when it was manufactured, it absorbed an undetected gas in the air at the manufacturing plant. This mystery gas is usually harmless, and therefore undetected, but can be deadly to anyone with an allergy to broccoli, and the uncle in question had precisely such an allergy. Is the niece still responsible? Is the pharmacist responsible? Is the foreman of the plant responsible, as they didn't test for (and thereby detect) the gas?

This is a silly example, of course, but I use it to illustrate that responsibility is not merely a transitive property of causal chains; on the contrary, claims about responsibility often track not only events in the world but the relationship between events in the world and an agent's *intentions*.ⁱⁱⁱ Moreover, it is very rare that an agent's intentions can be inferred directly from observing events in the world; in other words, that some event occurred (e.g. the niece gave the uncle the wrong medication) cannot alone determine an agent's intention (that the niece wanted to kill him.) It often takes an entirely different line of inquiry to reveal an agent's intentions than it does to reveal the cause of death. However, while this example fails to support Kojonen's claim that there are clear facts about when agential explanations are called for, it does illustrate something important and relevant to the debate: certain explanations leave what I will call an "*explanandum* remainder." An *explanandum* remainder is what remains to be explained after an explanation for some *explanandum* is given. In the aforementioned case, offering the uncle's overdose on medication as an explanation for his death leaves something to be explained: specifically, why did he overdose? Overdosing itself is not a "natural" occurrence and is usually the result of a grievous accident or human intention. In this

case, if we take the *original explanandum* to be “the uncle’s mysterious death,” an overdose adds to the mysterious circumstances of the death rather than eliminating them; if the uncle was not known to abuse his medication, we are still in need of an explanation that makes the uncle’s death unsurprising.

Compare this with the second case, where crop circles are declared to be the product of alien intelligence, but later discovered to be created by two tricksters who confess to creating them as a joke. Here the *original explanandum* is the generation of the crop circles, which is fully explained by the confession of the jokesters—there’s nothing mysterious about how a person might form a crop circle. Of course, we might wonder *why* they would want to make such a joke, or perhaps we might wonder *how* they were able to create the crop circles fully undetected. If that’s right, then there is some *explanandum* remainder, producing a call for further explanation, namely: why or how did they make this joke? However, there’s no reason to think the best candidate for such an explanation is aliens, which is why, as Ratzsch and Koperski point out, it would be silly to suggest the humans were being mind-controlled by aliens. Kojonen’s analysis of the case is that

...here, level-shifting is clearly implausible, because the alternative explanation eliminates the reason why the aliens were invoked as the explanation in the first place, and thus makes the reference to alien design unnecessary. Granted, in this case the alien designers are replaced with human designers, but we could in principle also imagine having video evidence of the crop circles being caused by a storm or other natural cause, in which case all reference to designers would be unnecessary (2021, 150).

I find this analysis quite surprising, given that if I were to see a video of a storm creating perfectly manicured crop circles—something that storms never do—I would want a further explanation about the very generation of the crop circles. This is precisely the sort of case that leaves an *explanandum* remainder, here the remainder being “why did that storm act in such an orderly way and contrary to the normal development of storms?” You might think that here an appeal to a “storm” that was alien-manufactured such that it produced the crop circles through secondary causes is the best explanation, or perhaps some detailed natural account of how the initial conditions lined up in

just the right way so “ordinary storm behavior” might produce crop circles. In any event, this *explanandum* is so strongly analogous to the author’s own foundation for the design argument I find it quite perplexing that he diagnoses it as a case where reference to design is unnecessary.

In sum, I think we might extract two important ideas from analyzing these cases: (i) some explanations leave an *explanandum* remainder, particularly when the explanation fails to reconcile the *explanandum* with the ordinary course of events and (ii) the elimination of an *explanandum* remainder requires generating a narrative on which the *explanandum* is unsurprising given the *explanans*.

On that note, let us return to the core of Kojonen’s argument for the compatibility of evolution and design arguments. While the author formulates two potential ways of understanding the design argument, given the focus of discussion on the nature of explanation, I will focus on his formulation of the design argument via IBE.

Premise 1: Some things in nature (or nature itself) exhibit property D (such as complexity ordered towards a purpose)

Premise 2: This property would be well explained if design was the cause. However, other explanations explain this property poorly.

Therefore, when comparing all available explanations, design is the best overall explanation of this property.

Therefore, property D was probably designed; at least this property provides more reason to infer design over competing explanations (2021, 78).

Kojonen’s formulation of the design argument suggests he views the *explanandum* of interest to be property D. In the aforementioned examples, Kojonen describes this property as something roughly equivalent to “appearing to have been caused by an agent”; Kojonen’s reading of both the uncle case and the crop-circle case is that they *prima facie* suggest intentional activity. I have argued, however, that what they actually reveal is some discordance between the way we expect things to happen given our understanding of the world and what actually happens. In the uncle case, we don’t expect the uncle to overdose on his medication, and we similarly don’t expect storms to make crop circles. Rather than view these occurrences as exemplars of property D, I argue we should take them as

instances of an *explanandum* remainder generating a call for further explanation; such calls tend to occur whenever we see something that stands in contrast to our expectations of the world.

However, these remainders do not in themselves specify intentional activity such as design.

Kojonen's second premise tracks the idea that a complete explanation will make the *explanandum* unsurprising given the *explanans*. In this case, Kojonen thinks whatever we make of property D, it will be *less surprising* if we posit it than if we do not. In what remains, I want to take up the question of precisely what this property D is supposed to be in the case of evolution, and if it is the case that an appeal to design makes that property less surprising.

With this in mind, let's return to Paley's watchmaker analogy. For example, consider this passage from *Natural Theology*:

In crossing a heath, suppose I pitched my foot against a *stone*, and were asked how the stone came to be there; I might possibly answer, that, for anything I knew to the contrary, it had lain there forever: nor would it perhaps be very easy to show the absurdity of this answer. But suppose I had found a watch upon the ground, and it should be inquired how the watch happened to be in that place; I should hardly think of the answer I had before given, that for anything I knew, the watch might have always been there (Paley [1802] 2006,7).

Paley's design argument begins with contrast. The fact that the watch is discovered in a heath is significant; the watch stands in stark contrast to its surroundings and other "natural" objects like the stone. Finding a watch in a heath initiates a call for explanation because the watch appears out of place in its environment; it is surprising. It's worth noting an interesting analog here to the story of Darwin and the Shrewsbury Bellstone. While Paley thought there was no reason to explain the existence of a particular stone, according to Darwin's autobiography, his interest in geology was fueled by precisely this.

I was prepared for a philosophical treatment of the subject [geology]; for an old Mr. Cotton, in Shropshire, who knew a good deal about rocks, had pointed out to me...a well-known large erratic boulder in the town of Shrewsbury called the 'bell-stone;' he told me that there was no rock of the same kind nearer than Cumberland or Scotland, and he solemnly assured me that the world would come to an end before

anyone would be able to explain how this stone came where it now lay. This produced a deep impression on me, and I meditated over this wonderful stone. So that I felt the keenest delight when I first read of the action of icebergs in transporting boulders, and I gloried in the progress of Geology ([1887] 2009, 23).

Paley and Darwin both find their explanatory curiosity sparked by a similar epistemic situation: some object that is unlike its surroundings inspires them to wonder about the origins of the object. For Darwin, this question has a natural answer: the rock was transported by glacial action. Paley, on the other hand, infers the answer to his question *must* be non-natural. As he goes on to say,

Yet why should not this answer serve for the watch, as well as for the stone? Why is it not as admissible in the second case, as in the first? For this reason, and for no other, viz. that, when we come to inspect the watch, we perceive (what we could not discover in the stone) that its several parts are framed and put together for a purpose ([1802] 2006, 7).

For Paley the difference points to a difference in kind—the watch contains a kind of complexity ordered for some purpose that is not immediately visible in the stone; while it was a mystery how the rock came to be in Shrewsbury there was no mystery of how the rock came to be ordered for some purpose.^{iv} Kojonen might argue that the real difference here is the watch displays property D while the rock does not.

But just what *is* property D? What is this feature of an object that makes it clear it was designed? Both Paley and Kojonen describe it as complexity for a “purpose,” and both seem to tacitly assume it is *impossible* for nature to produce something that appears this way. Throughout his book, Kojonen points to Paley’s classic example of the eye which appears “designed” for seeing. Kojonen further argues that while the eye itself exhibits complexity ordered for the purpose of seeing, evolution is a complex process ordered towards the purpose of producing complex organisms that can do things like see. For this reason, Kojonen argues that evolution instantiates property D. But if we return to Mayr’s picture of biology, teleology appears only at the level of an organism executing its naturally selected program, e.g. the eye seeing, while the mechanism which

produces the code for the organism displays no teleology at all. On Mayr's picture, evolution is neither complex nor ordered for a purpose. For those who accept Mayr's picture of evolution—that an entirely natural process of selection can produce, at the organismal level, a kind of functionality, both the claim that evolution displays property D *and* the claim that natural process cannot produce complexity towards a purpose are undermined. Kojonen, of course, disagrees with Mayr's understanding of evolution, arguing it is more complex than natural selection.^v However, even if we grant (for the sake of argument) that evolution is a complex process, can we recover Kojonen's claim that it is ordered towards a purpose? It is precisely this assumption the existence of the Hoosier cavefish calls into question.

As mentioned previously, Hoosier cavefish are blind fish that have anuses on their forehead in the place their ancestors had eyes. The current explanation for why fish with eyes produced fish with anuses on their heads is that when members of the species moved into dark caves, eyes no longer aided in survival but required a great deal of energy to maintain. The fish who required less energy were better fit for survival, and more likely to live long enough to reproduce. The reason why their anus wound up on their head remains unknown, although scientists suspect it must have somehow aided in reproductive success (Chakrabarty, Prejean and Nielmiller 2014).

Organisms like the Hoosier cavefish suggest that evolution does not always tend towards greater and greater complexity, or towards producing organisms with capacities for seeing. This raises some interesting worries for Kojonen. First, do the Hoosier cavefish exhibit property D? If we say yes, I find it quite hard to make sense of what, precisely, property D is. But if the answer is no, there is another worry. Remember, Kojonen argues that we ought to posit design as an explanation for evolution because evolution would be “well explained” if design were the cause. But does positing that evolution is designed “explain” the existence of the Hoosier cavefish?

To consider the worry from a different angle, let's return to the watchmaker analogy. Paley's initial impulse to declare the watch as designed arises from its contrast with its environment. While the rock needs no explanation—it is a fixture of nature—the watch displays great complexity and an ability to track time. This suggests a non-natural explanation *because* Paley assumes that natural processes produce things like rocks and not things like watches. But upon closer inspection, as Paley points out, *all* of nature turns out to be just as complex as the watch—“every manifestation of design, which existed in the watch, exists in the works of nature” ([1802] 2006, 16) Paley takes this to imply that all of nature is designed—however, one might take this fact to undermine the original need for an explanation. If it turns out that the rock and the watch are equally complex, the initial call for design—the contrast of the watch against the rock in a heath—disappears. Instead of assuming the rocks are also designed, we might just as easily assume the watch is natural. For Paley and Kojonen, presumably it is the purposiveness of nature that should force our hand towards design. But if we take *homo sapiens* and Hoosier cavefish to both be products of evolution, we have no reason to posit that evolution is directed towards one rather than the other. And while *homo sapiens* may seem like a reasonable “purpose” for a designer to pursue, the Hoosier cavefish does not.

The existential force of this worry manifested itself historically in the life and work of Charles Lyell. Lyell, one of the first champions of geology, who strongly opposed William Buckland's appeals to a Biblical flood, is often depicted as fundamentally opposed to divine explanations. However, the details of Lyell's story reveal quite the opposite. In early editions of *Principles of Geology*, Lyell explicitly denounced the possibility that the laws of nature, which he thought could explain the contours of the natural world and the animals living within it, could explain the existence of *intelligent humans*. Lyell was a deist, and had a “lofty conception of science as the search for laws governing a perfectly adapted divine creation” (Secord 1997, section V).

However, even though he thought the whole of the world was created, he found it to lack the special status of divine image-bearing he believed had been granted to humans. As James Secord writes,

“If evolution was true, Lyell believed, no divinely implanted reason, spirit or soul would set human beings apart; they would be nothing but an improved form of the apes that he watched, fascinated, at the newly opened London Zoo” (ibid).

For years Lyell was resistant to evolution, insisting there was a special, second act of creation which directly linked humans to divine intentions in a way that set them apart from the rest of the created world. Without this sort of special intervention, Lyell thought that reason itself, the crowning glory of humans and the basis of science, would lose its special status. The irony, of course, is that Lyell’s biggest fan turned out to be Darwin, and much to Lyell’s disappointment, Darwin eventually convinced him that *homo sapiens* are just another product of evolution, with no “special connection” to God’s intentions—at least, no connection more special than the apes. Moreover, Lyell supposed humans would then be entirely mortal, products of the earth with no reason to hope for some existence beyond it. This late life change of opinion led Lyell to cryptic musings in his journal.

November 1, 1858. If the geologist dwelling exclusively on one class of facts, which might be paralleled by the existing creation arriving at conclusions derogating from the elevated position previously assigned by him to Man, if he blends him inseparably with the inferior animals & considers him as belonging to the earth solely, & as doomed to pass away like them & have no farther any relation to the living world, he may feel dissatisfied with his labours & doubt whether he would not have been happier had he never entered upon them & whether he ought to impart the result to others (Secord 1997, section V).

Lyell viewed nature as a fleeting series of changes driven by a mix of natural laws and animal impulses. His belief in distinctive origin of human reason allowed him to view humanity as elevated over the at times disturbing natural order of things. But if human origins are in fact identical to the origins of all other organisms in nature, as Darwin convinced him they were, the belief in some special purpose of humans disappeared.

To summarize, then, it seems like “looking designed” isn’t a property intrinsic to an object, but a more general feature of epistemic situations. The watch, for Paley, and humans, for Lyell, appeared designed insofar as they were distinct from other “natural” elements. But if it turns out that *all* natural objects can be explained by a single process (i.e. complex in Paley’s case and evolved in Lyell’s), then our reason for picking out some part of nature as “special” disappears. In other words, perhaps the “call for design” is really just an instance of a “call for an explanation,” which occurs when we see something *out of the ordinary*, something that stands in contrast to its surroundings. And, if we view it that way, then discovering all of nature (including eyes and the *homo sapiens* that wear them) is produced through the same processes eradicates the grounds behind our call for an explanation.

The question Kojonen formulates as encasing the ultimate *explanandum* of the design argument is “How is it possible for there to be biological teleology at all, even complex biological teleology, rather than not?” For Kojonen, this biological teleology is the purpose towards which the complex process of evolution aims. But if biological teleology is merely, as Mayr puts it, an organism exploring its genetic program, then natural selection explains the existence of said teleology without any appeal to design. However, Kojonen continually suggests more robust understanding of biological teleology than an organism exploring its program; what remains unclear is what precisely this property is and if it’s instantiated by all of the organisms which evolution generates.

Kojonen is faced with a disjunction. Either (a) all (evolved) organisms exhibit property D or (b) only some products of the evolutionary process exhibit property D. At times, Kojonen speaks as if he is defending (a), for instance when he speaks of “laws of form”^{vi}, and at other times he speaks as if he is defending (b), specifically when considering the problem of evil and the problem of good. Both positions, I think, are susceptible to worries raised here. If Kojonen endorses (a) then whatever property D is we must take it to be exhibited by the Hoosier cavefish. However, it’s not clear that

positing design makes the Hoosier cavefish less surprising. This problem is amplified when we consider the problem of evil, and parts of the animal kingdom in which the suffering of organisms is intense and relentless. However, if Kojonen endorses (b), then it's unclear what grounds we have for maintaining that some aspects of nature are "special" given that they are all produced by the same process. Our *prima facie* reason for thinking they are special is that they seem unproducible by a natural process. But if they are, in fact, all generated in the same way (the watch just like the rock, so to speak), this "specialness" disintegrates.

Remember, Kojonen is not merely advancing that evolution and creation are compatible, but that evolution and design arguments are compatible. To maintain this view, Kojonen must show that evolution itself *implies* design. At bottom, it seems the only reason we would be moved to believe that the biological world generated by evolution implies design is if we find that the whole organic world appears, in some sense, perfectly intended. But this brings us back into old Panglossian worries, as well as the tension between Thomists and Tumblrists. For Thomists the order of the natural world is evident just by looking at it, while for Tumblrists the world is full of organisms that leave them asking "Evolution, wtf?"

To my eye, the "natural order" seems to reflect a little bit of both: hints of glorious design and hints of improper manufacturing. Given Kojonen's appeals to Platonic forms, it might be worth noting that Plato's perception of the natural world includes these two warring dimensions. Perhaps this tension is most clearly evidenced in his description of creation by imperfect design in the *Timaeus*. To explain why they exemplify both order and disorder, Plato suggests humans were designed by "lesser gods," who aimed to reflect the forms but lacked the skills and materials to do so perfectly.

He himself [the Demiurge] fashioned those that were divine, but assigned his own progeny the task of fashioning the generation of those that were mortal.
They imitated him: having taken the immortal origin of the soul, they proceeded next to encase it within a round mortal body [the head], and to give it the entire body as

its vehicle. And within the body, they build another kind of soul as well, the mortal kind, which contains within it those dreadful but necessary disturbances: pleasure, first of all, evil's most powerful lure, then pains, that make us run away from what is good, besides these boldness also and fear, foolish counselors both; then also the spirit of anger hard to assuage, and expectation easily led astray... (Plato 1997, 1270-71)

Plato's view of the human species as a strange blend of reason and irrationality calls for a more complex explanation of human origins than *mere* creation by perfect divine design. And perhaps the whole of the natural order suggests a different *explanandum* than any of those explored by Kojonen. The why-question we ought to answer may well be "why is the world such a mixed bag of beauty and horror?" Of course, the *explanandum* this question encapsulates can't be answered by a fine-tuning argument, biological or otherwise, because its very formulation implies the hope of slightly finer tuning that would produce more beauty and less horror. To put it another way, many elements of the world seem *more* surprising if we take them to be designed: why make a fish with its anus on its head? The solution, perhaps, is not to simplify our *explanandum*, eradicating what I find to be the real complexity of nature—the blend of apparent order and disorder, of pain and joy, of glory and terror—but instead to search, as Plato does, for a more complex narrative than the mechanistic fulfillment of a creator's purpose.

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ⁱⁱ Recently, Schupbach and Glass have argued for "conjunctive explanations," in which adding to the explanans of a particular explanandum may prove reasonable if it significantly strengthens the likeliness of the explanandum (Glass 2012, Schupbach 2016). In theory, this view doesn't conflict with the idea that there cannot be two complete explanations for a single explanandum; instead, the underlying supposition is that some alleged explanations are incomplete.

ⁱⁱⁱ Of course, the role of intention in agency and responsibility involves many significant disputes which I don't have the space to address here. It is worth noting that the example I offers bears a distant resemblance to the infamous Frankfurt cases, though their goal was to offer counterexamples to the principle of alternate possibilities which states that an agent is only responsible for her actions if she could have done otherwise (Frankfurt 1969).

^{iv} Although perhaps this difference is not as significant as it might appear. It's worth pointing out that one of the primary alternative explanations for the geological diversity in Shrewsbury and surrounding areas was that a divinely caused flood had resulted in geological samples from far away washing up on the shores of England.

^{vi} For example, see discussion of the work of Andreas Wagner (Kojonen 2021, 152).

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