

Explanatory Relevance and Contrastive Explanation

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A pluralist about explanation posits many explanatory relevance relations, while an invariantist denies any substantial role for context in fixing genuine explanation. This article summarizes one approach to combining pluralism and invariantism that emphasizes the contrastive nature of explanation. If explanations always take contrasts as their objects and contrasts come in types, then the role for the context in which an explanation is given can be minimized. This approach is illustrated using a classic debate between natural theology and natural selection about the structure of bees' honeycombs.

1. Introduction. This article focuses on two debates about the nature of genuine explanations of the form *A* because *B*. One debate concerns the number of explanatory relevance relations. Pluralists insist that there is more than one explanatory relevance relation, while monists maintain that there is only one such relation. A pluralist thus maintains that when "*A* because *B*" is true, there is some relation between *A* and *B*, but the character of this relation can vary from explanation to explanation. For example, some pluralists suppose that causal explanations deploy a different relevance relation than grounding explanations. Another debate about explanation focuses on the role of the context in which an explanation is given. Contextualists maintain that the truth of "*A* because *B*" requires the presence of additional factors beyond what is invoked by "*A*," "because," and "*B*." Invariantists respond that fixing "*A*," "because," and "*B*" is all that is needed for it to be determined whether or not "*A* because *B*" is true.

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Many pluralists are also contextualists. This article aims to undermine two arguments for contextualism based on pluralism about explanation. The first argument, presented by van Fraassen (1980), relies on imagined cases and our intuitions about what explains. The second argument, found in Woody (2015), turns on variations in the explanatory practice of scientists. Both arguments are blocked by illustrating one coherent way to combine explanatory pluralism with invariantism. On this approach, there is more than one explanatory relevance relation, but “*A* because *B*” is true solely in virtue of *A*, *B*, and their relationship. My proposal involves two claims. First, the genuine relata of explanations are contrastive facts of the form “*P* rather than *Q*.” Second, contrastive facts come in kinds, and each contrastive fact of a given kind is apt to be explained by contrastive facts of at most one kind. This approach supports invariantism: the character of the explanandum contrast *A* precludes the need for any additional contextual factor. In particular, there is no need for the explanatory relevance relation to be determined by the context in which an explanation is given. One advantage of this proposal for scientific realists is illustrated briefly: as science changes, different explanatory targets are selected, but there is no change in the underlying character of explanation itself.

2. Contextualism and Explanatory Practice. Explanatory pluralism can be justified by drawing attention to the wide variety of accepted explanations, both in the history of science and in different areas of contemporary science. Van Fraassen pioneered this position using his “pragmatic” theory of explanation and, crucially for our purposes, tied his pluralism to contextualism. Van Fraassen presents explanations as answers to why-questions “Why *A*?” where the surface form of the question leaves open many essential factors that are determined by the context in which the question is posed: “we must say of a given proposition that it is or is not relevant (in this context) to the topic with respect to that contrast-class” (van Fraassen 1980, 142). One argument that van Fraassen uses to motivate this theory of explanation is to construct pairs of closely related why-questions and to draw on our intuitions about acceptable answers to these questions in some context. For example, he tells a story that involves one person explaining the height of a tower in terms of the length of the shadow that it casts at a given time of day (132–34). This is meant to undermine the claim that there is a privileged direction to explanation. Sometimes, we are meant to conclude “*A* because *B*” is a legitimate answer to a why-question “Why *A*?” while “*B* because *A*” is a legitimate answer to another why-question “Why *B*?” What varies is the context, which settles both the contrast class and the relevance relation.

Other contextualists are reluctant to rest their case on “intuitions” or imagined examples. Instead, they draw attention to the role of explanation

within scientific practice. Given the manifest pluralism exhibited in scientific practice, it is supposed to be clear that some version of contextualism is mandated. This type of argument is clear in Woody's (2015) recent presentation of a "functional perspective" on explanation. Woody emphasizes how the variety of types of scientific explanations is tied to the many different ways in which scientists have evaluated proposed explanations. These evaluations take a different form, depending on which community of scientists is being considered. Woody uses this variation to support a form of contextualism and pluralism that resolves some of the problems that van Fraassen encountered. She argues that what makes a proposed explanation correct is largely determined by the broader aims of that community. As those aims change, so too will the standards appropriate to the evaluation of some potential explanation. Thus, unlike van Fraassen, Woody is focused on "what aspects of context *legitimately* influence the adequacy of scientific explanations": "the functional perspective underscores the essential role of community norms in determining which aspects of context are judged relevant. It also supplies a rudimentary structure, through appeal to a given community's epistemic aims, for philosophical analysis of whether particular norms are indeed appropriate" (85). We can consider what a given community is aiming to achieve and use that goal as a standard to evaluate the appropriateness of its explanatory practice. The variation in explanatory practice thus receives a plausible diagnosis.

Here, then, are two arguments for contextualism based on pluralism. In the remainder of this article I show how these arguments can be countered by embracing a certain form of invariantism that is consistent with pluralism. I defer a discussion of cases like van Fraassen's tower and shadow to the next section, where I outline how to accommodate such cases using contrastive explanation. In this section I wish to discuss arguments from the variation in explanatory practice. This variation does license pluralism, but not contextualism. My primary objection to using explanatory practice to support contextualism is that there are many elements of explanatory practice that clash with contextualism. The contextualist who deploys this argument must then draw only on selected aspects of this practice and discount other aspects as misguided or confused.

To illustrate the tensions between explanatory practice and contextualism, I will draw on what is perhaps the most famous use of explanatory considerations to motivate a change in scientific practice. This is Darwin's *Origin of Species*. Darwin presents his book as "one long argument" (1859/2008, 338). While commentators have struggled to clarify what this argument is, it is uncontroversial that Darwin took the explanatory power of his theory of evolution by natural selection to be part of the evidence that his theory was true. As Darwin puts it, "I cannot believe that a false theory would explain, as it seems to me that the theory of natural selection does ex-

plain, the several large classes of facts above specified” (353). This is one element of explanatory practice that clashes with contextualism.

Darwin’s argument takes the form of an inference to the best explanation (IBE), and the tensions between IBE and explanatory contextualism are considerable. The source of this incompatibility is difficult to diagnose, but one suggestion is that IBE presupposes both that genuine explanations are permanent and that their genuineness has an ontic or worldly basis. If evolution by natural selection really does explain the features of living things on the earth, then this is due to how the world is independently of scientific activity. As a result, such a genuine explanation is a permanent explanatory resource for any investigation of these biological phenomena. Against this, the contextualist makes the genuineness of the explanation turn largely on contextual factors. For van Fraassen these factors are built into the why-question, and so as different questions are posed by different scientists, the right answer will also vary. It is thus no surprise to find that van Fraassen is hostile to IBE and any form of scientific realism based on IBE (van Fraassen 1989, chap. 6). Woody makes the correctness of an explanation turn on community-wide factors such as the aims of a given research community. This leads her to deny that genuine explanations are permanent as their genuineness is tied to the constancy of the community’s research aims. Although she departs from van Fraassen in many respects, Woody also rejects IBE: she denies the claim that “we prefer explanatory scientific theories because explanatory theories are, *ceteris paribus*, indicative of truth” (2015, 86). For the contextualist, the explanatory power of a new theory like Darwin’s cannot act as “a mysterious seer” (86) to redirect scientific commitments.

I claim that the contextualists’ wholesale rejection of IBE clashes with scientific practice, where we find considerable use of IBE in one form or another. Some historical background on one aspect of Darwin’s argument in *Origins* helps to make this clear. Prior to Darwin natural theologians had celebrated the fact that bees build their honeycombs in hexagons. Pappus had shown that the most efficient means to cover a two-dimensional plane using cells shaped as regular polygons was to use hexagons. So, it seemed to many that the correct explanation of the bees’ behavior was that God had made the bees with the capacity for this efficiency. For example, the eminent entomologist William Kirby, in his 1836 contribution to the *Bridgewater Treatises*, exhorted “those Heaven-instructed mathematicians, who before any geometer could calculate under what form a cell would occupy the least space without diminishing its capacity, . . . instructed by the Fountain of Wisdom, had built their hexagonal cells” (Kirby 1836, 376).¹ Darwin argued that the

1. This passage and additional discussion are given at <https://www.darwinproject.ac.uk/commentary/life-sciences/evolution-honeycomb> and Davis (2004).

bees' instinctive behavior was an adaptation that resulted from the working of natural selection: "that individual swarm which wasted least honey in the secretion of wax . . . will have had the best chance of succeeding in the struggle for existence" (2008, 175). This is an apparent conflict between the explanatory practice of two communities. On the one hand, we have the long-standing practice of tracing traits that benefit organisms to the benevolence and wisdom of God. On the other hand, there is Darwin's novel explanatory innovation of grounding such traits in the gradual, natural process of variation, differential fitness, and heritability.

One contextualist diagnosis of this apparent conflict is that it is a pseudo-conflict: when Kirby says "the bees use hexagons because God made them that way" and Darwin says "the bees use hexagons because natural selection made them that way," there is no incompatibility between these two claims. For what Kirby's words express includes a contextually specified factor that is different from what Darwin's words express. If there is no conflict between Kirby and Darwin, then Darwin is wrong to use the explanatory power of his theory as evidence that Kirby's explanation is incorrect. More generally, there can be no legitimate use of IBE to resolve a scientific disagreement. Woody seems to endorse this aspect of her contextualism when she discusses the role of the ideal gas law in contemporary chemistry: "In essence, explanatory discourse involving the ideal gas law displays *an ideal of intelligibility* for students of chemistry" (2015, 83; emphasis added). Research communities are largely individuated by the standards they impose on genuine explanation. Kirby and Darwin display conflicting ideals of intelligibility in their proposed explanations, and they thus belong to different communities. As a result, Woody's version of contextualism cannot endorse any kind of argument for Darwin's theory based on the extent to which Darwin's theory satisfies the criteria for a good explanation. IBE is blocked in these cross-community cases.²

I claim, then, that contextualism about explanation sacrifices IBE when it rejects what I have called the permanence and the ontic basis of genuine explanation. One prominent feature of explanatory practices as diverse as Kirby's and Darwin's is that the practitioners take a genuine explanation to be a permanent resource that is apt to be incorporated into a wide variety of scientific communities. The reason for this is that genuine explanations are thought to be genuine largely because of how the world is independently of human activity. Scientific communities may come and go, but there is some collection of facts that circumscribe the genuine explanations for the bees'

2. An anonymous referee notes that some contextualists might put Kirby and Darwin in the same community and thus avoid this problem. I agree that this is available to contextualists in principle, but all versions of contextualism that I am familiar with have difficulty making sense of this sort of debate.

hexagonal honeycomb building.³ It is this aspect of explanatory practice that clashes with contextualism. Darwin clearly took his explanation to rule out the natural theological explanation. There was an incompatibility to the two proposed explanations that is tied to the permanence and ontic basis of a genuine explanation. This is why the correctness of one explanation precludes the correctness of the other. Furthermore, I would argue that it is only on this basis that we can make sense of Darwin's endorsing his form of IBE. What makes an explanation correct is how the world truly is, and so to the extent that a theory affords a wide range of seemingly correct explanations, we have indirect evidence that the theory is in fact true.

This section has considered one influential argument from pluralism to contextualism based on certain features of explanatory practice. I agree with van Fraassen, Woody, and others that the standards that scientists deploy when evaluating proposed explanations do often vary from community to community. At the same time, an examination of scientific explanatory practice reveals other features beyond this variation. Scientists themselves often endorse some form of IBE and take genuine explanations to have a permanent, ontic basis. To do justice to this practice, we must fashion an account of explanation that accommodates all of these features and not just some of them. The contextualist emphasizes the variation in apparent standards but sacrifices the other aspects of explanatory practice that I have emphasized. Of course, it is always possible that scientists are confused and that their explanatory practice is indefensible or incoherent. I am not intending to rule that out. My point is only that an argument based on how scientists develop and evaluate explanations cannot presume that some aspects of this practice are legitimate and that others are confused. In the next two sections I will outline an approach to explanation that can accommodate all these aspects of explanatory practice.

3. Contrastive Explanation. An increasing number of philosophers argue that causation, explanation, or both are essentially contrastive.⁴ Many of these contrastivists about explanation also reject explanatory contextualism. This is especially prominent in Woodward's work. Woodward's manipulationist account of causation immediately implies that the genuine relata of causal claims are contrasts: *c* rather than *c'* causes *e* rather than *e'*. The reason is that the value *x* of variable *X* causing the value *y* of variable *Y* is always tied to the existence of an intervention on *X* that would bring about

3. I intend to allow that this fact has many genuine explanations. As I discuss later, my aim is eventually to argue that each well-defined target of explanation has only one kind of explanation, e.g., causal.

4. Here I draw especially on Sober (1994), Hitchcock (1996, 2013), Woodward (2003, 2015), Lipton (2004), and Schaffer (2005, 2013).

a change in the actual value of Y . As Woodward puts it, “all causal claims must be interpretable as having a contrastive structure . . . [and] to causally explain an outcome is *always* to explain why it rather than some alternative occurred” (2003, 146).⁵ In more recent work Woodward (2015) has embraced an explanatory pluralism that countenances many explanatory relevance relations as distinct species of dependence relations. The contrastivism remains as noncausal explanations still center on generalized forms of manipulation and difference making.

In addition to this contrastivism and pluralism, Woodward has also repeatedly embraced what I am calling invariantism: “interest relativity enters into what we explain but not into the explanatory relationship itself. What we try to explain depends on our interests, but it does not follow that for a fixed explanandum M and fixed explanans E , whether E explains M is itself interest-dependent” (2003, 230). There is thus a conflict between Woodward and Woody. While Woody uses her pluralism to argue for contextualism, Woodward insists that pluralism is perfectly consistent with invariantism.

There is a puzzle, though, for those who wish to maintain both pluralism and invariantism. This puzzle may have motivated some pluralists to be contextualists. Recall that a pluralist says that when “ A because B ” is true, there is some relation between A and B , but that the character of this relation can vary from case to case. For example, Woodward would allow that in some cases A is causally dependent on B , while in other cases A is dependent on B in some other way. However, if this is the case, it may appear that contextualism is required. For when “ A because B ” is true, its truth is not due simply to what is expressed by “ A ,” “because,” and “ B .” There seems to be a need for a contextually fixed factor that will determine the kind of dependence that is in question. As there is more than one kind of dependence, a claim expressed by “ A because B ” may be true for one such dependence relation and false for another dependence relation. The context, it appears, should settle which relation is intended.

Here I propose one way to address this puzzle and so vindicate the combination of pluralism and invariantism. I cannot argue here that this is the best way of combining these views but maintain only that this is a promising strategy that is worth pursuing. The core claims of this approach are that explanation is contrastive and that contrastive facts come in types that are apt to be explained in only one way.⁶ Each explanation is first tied to a why-question that invokes a contrast: “Why P rather than Q ?” Following Woodward and many others, we can take as a central case the situation in which P

5. This passage is given by Schaffer (2005, 354). Schaffer, unlike Woodward, emphasizes that both the cause and the effect should be given a contrastive form.

6. Additional discussion of this approach to explanatory pluralism is provided by Pincock (2018).

is some actual event and Q is some contrary (but physically possible) event. For example, “Why did the temperature in the room go below 72°F rather than staying above 72°F?”⁷ Here “ P ” is an entire sentence that picks out an event, namely, that the temperature in the room changed from above 72°F to below 72°F. And Q is also an entire sentence that picks out a contrary event that is incompatible with P . Following Woodward, we can suppose that a causal explanation for P rather than Q is some other contrast that is appropriately tied to an intervention on this system that would have made it the case that Q occurred rather than P . For example, we may suppose that a powerful air conditioner was turned on shortly before P occurred. If so, then it is true that the temperature in the room went below 72°F rather than staying above 72°F because a short time earlier a powerful air conditioner in the room was turned on rather than being left off. The cause and its effect are both given a contrastive structure.

Whenever there is a true statement of this form “ P rather than Q ,” I will suppose that a special sort of contrastive fact obtains in the world. I claim that contrastive facts that involve contrary events are apt to be explained in only one way. The only true “because” claims that target such contrasts are causal explanations.⁸ If this claim is granted, then it is clear how invariance can be defended for these explanations. For we will have an explanation whose genuine structure is explicit in a statement like “ P rather than Q because R rather than S .” Even though there are many explanatory relevance relations, the character of the explanandum indicates which relevance relation is required for the statement to have a chance of being true. It must be the causal relevance relation. If so, then the truth of this “because” statement does not require any contextually determined relevance relation. The appropriate relevance relation is fixed by the target of the explanation, P rather than Q . This proposal fleshes out the invariantist assertion found in the Woodward passage given above: once the target explanandum is fixed, there is a determinate range of objectively correct explanans. What I have added to Woodward’s position is the further, controversial claim that the explanandum itself restricts the type of potential explanans. In the case of a contrast between two contrary events, all potential explanans must be other contrasts between contrary events. For the explanation to be genuine, the contrast R rather than S must stand in a causal relevance relation to the target contrast P rather than Q .

7. I am grateful to Brad Skow and Jonathan Schaffer for pressing me on these issues during the presentation of this paper. See especially Skow (2016) for a different way to approach explanatory pluralism using a notion of levels.

8. This does not mean that each such contrast has only one explanation. There may be many explanations of this contrast, but they will all involve the same explanatory relevance relation, namely, causal relevance.

Perhaps the most popular current form of explanatory pluralism distinguishes causal explanations from grounding explanations. Not everyone accepts this kind of pluralism, however.⁹ I do not intend to resolve this debate here. Instead, I will outline a general strategy that can be implemented for a defender of this form of pluralism who aims to endorse invariantism. The key move is to distinguish contrastive facts that might otherwise appear identical. Consider, for example, the contrastive fact discussed above: that the temperature in the room went below 72°F rather than staying above 72°F. Some pluralists would say that this very fact has two kinds of explanation. One sort of explanation is the causal explanation outlined above that cites an earlier contrastive fact between events. Another sort of explanation would invoke the grounds. For example, let us suppose that the mean kinetic energy of the gas molecules in the room grounds the temperature of the room. Then it seems that a contrast involving this mean kinetic energy would provide a distinct explanation of our original contrast in terms of the explanatory relevance relation of grounding. One such contrastive fact is that the mean kinetic energy of the gas molecules in the room decreased below threshold T rather than remaining the same. It looks, then, as though we have not only a causal explanation of our contrast in terms of events involving the air conditioner but also a grounding explanation of that very same contrast in terms of events involving the gas molecules.

I claim that a grounding explanation explains only a contrast between states, while a causal explanation explains only a contrast between events. A state is something that obtains at a time, while an event is a relation between states that occurs over time. For example, we can speak of the temperature state of the room at noon on Monday. One kind of explanatory investigation will consider the basis for that state. What is it, after all, that constitutes that state? But we should not conflate this question about this state from a different kind of explanatory investigation. What brought about a change in state, that is, an event? The distinction between events and states allows one to distinguish two contrastive facts. First, there is the contrastive fact that involves contrary events: that the temperature in the room went below 72°F rather than staying above 72°F. Second, there is the contrastive fact that involves contrary states: that the temperature in the room is 71°F at noon on Monday rather than being 73°F. The contrast of states is apt to be explained using a grounding explanation that involves a contrast between more fundamental states, for example, the kinetic energies of the gas molecules. No such explanation will work for our original contrast between contrary events.

With these materials in place, we can finally return to van Fraassen's original argument for contextualism that involves cases such as the tower and the

9. Compare Skow (2016) and Reutlinger (2017).

shadow. I want to argue that each explanation is associated with a contrastive fact and that each contrastive fact has only one kind of explanation. There is thus no need to independently assign the contrasts and the explanatory relevance relation, as van Fraassen claims. In van Fraassen's story, the tower in question is 175 feet tall and it covers a certain terrace each day at sunset. We must distinguish three types of contrastive facts associated with this story that are apt to be explained in three different ways. In addition to the causal and grounding explanations that we have already considered, the tower is also an artifact whose features are apt to be explained in terms of actions. To start, there are two contrasts that involve a contrast between states and a contrast between events: (i) Why is the tower 175 feet tall rather than 180 feet tall? (ii) Why did the tower's shadow become X feet long at sunset rather than Y feet long? Question i is answered by appeal to the constitution of the tower, while ii is answered in terms of events originating with the sun. But two other contrasts are implicated in van Fraassen's story, and both presuppose that the tower is an artifact: (iii) Why was the tower built to be 175 feet tall rather than 180 feet tall? (iv) Why was the tower's shadow meant to be X feet long rather than Y feet long? These questions require an answer that mentions the actions of the designer of the tower. Let us suppose that an explanation of an action requires a different explanatory relevance relation, in line with some forms of explanatory pluralism (McLaughlin 2013).¹⁰ If we make this assumption, then it is clear that the actions of the designer of some artifact are relevant to the features of the artifact in some special way. In van Fraassen's story, the narrator is first given an explanation in response to question iii but then learns that the genuine explanation is only an answer to question iv. The tower's shadow was meant to cover the terrace at sunset each day rather than accomplish some other goal. There is thus no need to settle the explanatory relevance relation in addition to the contrast. Once the contrastive fact is fixed, there is only one explanatory relevance relation that is viable.

4. Presupposition. One objection to this version of invariantism is that there is no reason to suppose that contrasts really come in types that are apt to be explained in at most one kind of way. What in the end is the link between the character of the contrast and the supposedly privileged explanatory relevance relation?¹¹ I here follow Lipton (2004) and Sober (1994), in particular, and maintain that the elements of the contrast and their juxtaposition settle how the explanation must go. What makes an event happen,

10. If rationalizations are causal explanations, then we simply have a contrast being explained by more than one explanation of the same type, and so invariantism is maintained.

11. I am grateful to an anonymous referee for pressing this worry.

rather than some other event, is a cause. What makes a state obtain, rather than some other state, is a ground. What makes an artifact have some feature, rather than some other feature, is an action of the artifact's creator. These tight connections give us some reason to think that in other cases, the character of the contrast settles how the contrast can be explained (if it can be explained).

This sort of proposal is common among contrastivists about explanation. Lipton and Sober have done the most to clarify this issue for the special case of causal explanation. Sober argues that the contrastive fact that *P* rather than *Q* presupposes not only that *P* occurred and that *Q* did not occur, but also that there is a common cause that links the occurrence of *P* and the nonoccurrence of *Q* (Sober 1994, 178). Lipton presents a more flexible presupposition under the heading of his "difference condition": "we must cite a causal difference between *P* and not-*Q*, consisting in a cause of *P* and the absence of a *corresponding event* in the case of not-*Q*" (Lipton 2004, 42; emphasis added). This is less demanding than requiring a common cause as the "corresponding event" for *Q* may be unconnected to the cause of *P*. For example, Lipton emphasized the possibility of explaining the contrast between Jones rather than Smith having paresis via Jones rather than Smith having syphilis. In cases in which the contrasts involve events that are compatible, it would seem that Lipton's more flexible difference condition is appropriate.

I propose to generalize Lipton's proposal by using the character of the contrast to arrive at a presupposition of an explanatory question that involves that contrast. An explanatory question that involves a contrast between events presupposes that there is some cause in terms of a distinct contrast between corresponding events. An explanatory question that involves a contrast between states presupposes that there is some ground in terms of a distinct contrast between states. And, for our third type of explanation, an explanatory question that involves a contrast between features of artifacts presupposes that there is some contrast in actions that is appropriately related to the features of the artifact.

The existence of these presuppositions is highlighted in cases in which no presupposition arises, and so no genuine explanation is thought to obtain. Consider the proposed contrast that Jones has syphilis rather than the tower being built to be 175 feet tall. When a contrast involves elements that cross categories, then there is no well-defined presupposition for this contrast. As a result, we suppose that there is no genuine explanation for this contrast. Analogous cases can occur even when a contrast draws on elements from the same category: that the tower was built to be 175 feet tall rather than the car being painted blue. This contrast has no genuine explanation, we suppose, because we cannot make sense of an explanatory contrast that would stand in an appropriate relevance relation. There are no corresponding actions that would make this contrast in artifacts obtain.

The version of pluralism and invariantism sketched here does justice to all the features of explanatory practice that I discussed in section 2. Among other benefits, it permits a satisfying diagnosis of the changes in explanatory practice that contextualists struggle to make sense of. Recall, for example, the shift from Kirby's natural theological explanation of the bees' honeycomb to Darwin's adaptationist explanation. Woody argues that the aims of a research program legitimately constrain the standards with which such explanations are evaluated, but this left us unable to vindicate the use of IBE. My diagnosis of this shift in explanatory practice unsurprisingly focuses on the contrasts in question. Kirby treated the bees' instinctive behavior as an artifact and thus presupposed that a certain type of explanation was genuine. Kirby's explanatory question was, "Why were the bees *designed* to build their honeycombs in hexagons rather than circles?" Just as with questions iii and iv above, this contrast is apt to be explained by only one type of explanation, namely, an explanation in terms of the actions of the artifact's designer. Darwin's question was quite different: "Why were the bees *adapted* to build their honeycombs in hexagons rather than circles?" This contrast is apt to be explained in terms of the operation of ordinary natural causes, which Darwin of course took to include the operation of natural selection. The shift in explanatory practice is thus tied to a shift in explanatory target. Scientists shift explanatory targets when they come to believe that the presuppositions of the original target fail to obtain. Kirby thought that a certain kind of contrastive fact obtained, but we no longer countenance that fact because we have rejected its presuppositions. Darwin presumed that a different kind of contrastive fact obtained, and we agree with Darwin that this fact is genuine because we believe that its presuppositions obtain. As a result, we suppose that it is apt to be explained causally.

5. Conclusion. This article has presented a novel and promising way to combine explanatory pluralism and explanatory invariantism. This shows that there is no valid argument from pluralism to contextualism. The core of this position is to maintain that all explanation is contrastive. If contrastive facts fall into different types, and each type is accounted for only in at most one sort of way, then the pluralist can match the types of contrasts to their various explanatory relevance relations. The main attraction of this position is the way it allows one to accommodate all the features of explanatory practice that have frustrated extant accounts. It is possible to make sense of changes in standards for explanation using ordinary shifts in what scientists take themselves to know. In this way, one may hope to defend some form of genuine scientific realism, progress, and IBE. Many open questions remain for this proposal, including the delimitation of the explanatory relevance relations and a more substantial theory of the contrastive facts that these relations are associated with.

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