

2 Introducing Empty-Base Explanation

In this chapter I define the notion of empty-base explanation, argue that the nature of explanation allows for there to be empty-base explanations, and that we should take the possibility of empty-base explanation seriously. Instead of saying that the notion of empty-base explanation is coherent, that the nature of explanation allows for the existence of empty-base explanation, and that the possibility of empty-base explanation should be taken seriously, I will sometimes say that (the notion of) empty-base explanation is legitimate. In arguing for this legitimacy thesis, I present plausible candidates for empty-base explanations, argue that the notion of empty-base explanation allows for fruitful theorizing, address some concerns about the idea of empty-base explanation, and give an overview of the following chapters which discuss several applications of empty-base explanation and further investigate its nature.

The outline of the chapter is as follows: In section 2.1, I define the notion of empty-base explanation. In section 2.2, I present plausible candidates for links of empty-base explanations and offer a number of arguments to the effect that the identified propositions indeed help constitute plausible candidates for empty-base explanations, thus arguing for the notion's legitimacy. A prime role is played here by the notion of zero-ground, introduced by Kit Fine (2012): Instances of zero-ground amount to empty-base grounding explanations.

In section 2.3, I argue for the legitimacy thesis further by discussing empty-base explanation vis-à-vis explanations as answers to why-questions and the communicative act of explaining why. A result of this section will be that since just like explanations why in general, empty-base explanations correspond to because-answers, our ordinary use of 'because' needs to be extended (in a systematic and justified fashion, of course). I propose that we either use '... because $\emptyset$ ' or adapt the locution 'just because' for this purpose and say that acts that are empty-base explained obtain *just because*.

In section 2.4, I support the legitimacy thesis with a look at the phenomenon of understanding why as well as epistemic features of explanation why. I show that an attractive account of understanding why allows for instances of understanding why that correspond to empty-base explanations, and argue that at least some of the candidates for empty-base explanations do indeed provide us with understanding why.⁵⁷

⁵⁷ More precisely, I should write 'hypothetical understanding why': If the relevant explanatory links obtain, then they can underwrite understanding why the corresponding explananda obtain.

Section 2.5 discusses the significant theoretical potential and fruitfulness of the notion of empty-base explanation. First, I rebut a sentiment that I have sometimes encountered, according to which empty-base explanations are arcane and of questionable epistemic value. Second, as teased in the introduction, I offer an account of ultimate explanation in terms of empty-base explanation. Third, I describe some of the ways in which the notion of zero-ground specifically has proven fruitful so far.

The last section 2.6 draws the outline for the remainder of the book, which will further investigate empty-base explanation and its applications, and thereby continue to support its legitimacy. Finally, the appendix to this chapter shows in some more technical detail how to make sense of an explanatory link connecting an empty base of reasons why to an explanandum.⁵⁸

2.1 Defining the notion of *empty-base explanation*

Recall from chapter 1 that explanations why involve facts in the three roles of result, link, and sources (constituting the base). This allows us to introduce the notion of empty-base explanation by asking whether every explanation does indeed need all three: sources, a link, and a result. It seems intuitively obvious that a result and a link are always needed, but the assumption can also be argued for: Every explanation has a result because every explanation is an explanation of something. The thesis that every explanation has a link can be justified inductively or by observing that in every explanation something ‘does the explaining’. Then if the explanation involves sources, then there is also something which specifies how the sources explain the result and this is the link. If the explanation does not have sources, there has to be a link to do the explaining.

What I want to argue here is that there could be explanations which do not have sources, that is, whose base is the empty set of facts or propositions. I will call these postulated explanations without sources ‘empty-base explanations’:

(Empty-base explanation)

x is an empty-base explanation iff_{def.} x is an explanation with an empty base.

As noted in the previous chapter, ‘explanans’ often refers to the sources of an explanation. It is in this sense that an empty-base explanation has no explanans: It

⁵⁸ This chapter has grown out of parts of Kappes and Schnieder (2016), with parts having been published before in Kappes (2021, 2020a, 2022). The appendix is based on joint work with Julio De Rizzo.

involves no sources; its base is empty. In the previous chapter I have also defended the view that the sources of an explanation why P are reasons why P , while the corresponding explanatory link normally is not a reason why P . According to this view, empty-base explanations why P are explanations that normally do not involve reasons why P .⁵⁹

While the notion of empty-base explanation is thus easily defined, more work has to be done to properly explain it, show that it is coherent, and show that the nature of explanation allows for empty-base explanations, as well as that we should take the possibility of empty-base explanation seriously. In the next section I will present plausible candidates for links of empty-base explanations and argue that there indeed is a kind of explanation without sources. Note that while I believe that there are indeed true, successful, empty-base explanations, for the purpose of this chapter I am not committed to the success of any of the given candidates – what I want to argue is that the notion of empty-base explanation is legitimate in the sense characterized above; it is a further question how this kind of explanation is instantiated.

For now, I will look at explanations in the sense of collections of truths or facts of which one is explained by the others.⁶⁰ In section 2.3 I will discuss how what I have said so far relates to explanations in the two senses of communicative acts and answers to why-questions, and in section 2.4 I will discuss empty-base explanation why vis-à-vis understanding why and epistemic features of explanation. There I will also address a potential worry that has perhaps already occurred to the reader: Recall from the previous chapter that explanatory links why P normally are not reasons why P . Hence, many empty-base explanations why P do not involve reasons why P . But if an explanation why P is or at least has to involve an answer why P , and answers why P cite reasons why P , how could there be empty-base explanations?

59 Using some resources that will be introduced below, a little bit more can be said here: One example of a proposition that has an empty-base explanation why P , whose link is also a reason why P , is provided by any disjunction $[O \vee L]$, where $[O]$ is a zero-grounded fact $[O]$ and $[L]$ is a fact that is grounded by any grounding fact whatsoever, for example $[pp]$. $[O \vee L]$ is zero-grounded because disjunctions are grounded in their true disjuncts, grounding is transitive, and one of its disjuncts is zero-grounded. But the fact that $[O \vee L]$ is zero-grounded also grounds $[O \vee L]$ and hence is a reason why $O \vee L$, because it grounds the other disjunct of $[O \vee L]$, namely $[L]$. What can be seen here is that while the fact $[O \vee L]$ is zero-grounded, we have two distinct explanations why $O \vee L$, first the empty-base explanation which features no facts in the role of reason, but features a link which happens to also be a reason why $O \vee L$, although featuring in this role in a different second explanation why $O \vee L$.

60 See chapter 1, sections 1.1 and 1.2.

2.2 Legitimizing empty-base explanation

So how *could* there be empty-base explanations? We can start by considering what it would take for a causal or grounding explanation to be an empty-base explanation: A causal empty-base explanation would amount to a causal explanation without causes, while an empty-base grounding explanation would amount to a grounding explanation without grounds. But how could that be? Is it not the explanans that does the explaining, and without any reasons such as causes or grounds to do the explaining, there is no explanation? The goal of this section is to address these questions and argue for the legitimacy of empty-base explanation – that the notion is coherent and that the nature of explanation allows for empty-base explanations. While we will encounter empty-base grounding explanation shortly, discussion of causal empty-base explanation will have to wait until chapter 5. Until then, we will primarily think about varieties of metaphysical and conceptual explanation.

The argument of this section proceeds as follows: First, I will present certain kinds of propositions or facts that I suggest can play the role of explanatory links in empty-base explanations. This claim is then argued for by a number of considerations, stemming from:

- certain metaphors and intuitions concerning explanation,
- the thesis that explanations trace explanatory links,
- the correspondence between explanatory arguments and explanation, and
- the thesis that empty-base explanation best accounts for what I call ‘explanation by status’.

The arguments of this section are supplemented in the remainder of this chapter by:

- a discussion of empty-base explanation vis-à-vis explanation as a communicative act and explanations as answers to why-questions (section 2.3),
- considerations concerning the epistemic role of explanations and understanding why (section 2.4),
- remarks on the theoretical potential and limits of empty-base explanation (section 2.5), and
- a slightly more technical look at the links of empty-base explanations (appendix).

The remaining chapters then complete my overall argument.

2.2.1 Candidates for links: unconditional explanatory laws, essences, and zero-ground

Let us now come to the candidates for links of empty-base explanations. We will look at metaphysical explanation and explanations whose links are laws of nature. Different kinds of metaphysical explanations and different kinds of explanatory links for metaphysical explanations are being discussed in the literature, including links involving metaphysical grounding, essential dependence, and metaphysical laws. Here are some paradigmatic examples for such links:

- (G) That the sun is crimson grounds that the sun is red.
- (E) It is true in virtue of the essence of {Socrates} that if Socrates exists, {Socrates} exists.
- (M) It is a metaphysical law that if something is in physical state *s*, then it is in mental state *m*.

Of the three metaphysical notions involved, grounding is perhaps most widely discussed.⁶¹ Metaphysical laws have been suggested as explanatory links by, e.g. Schaffer (2017) and further discussed by Kment (2014), Wilsch (2016), and Schaffer (2018). Essential dependence as an explanatory notion has been suggested, for example, by Schnieder (2010) and Kment (2014).⁶² Beyond metaphysical explanation we will look at explanation involving as links laws of nature like the following:

- (N) It is a law of nature that for all x_1, x_2, m_1, m_2, d , if x_1 and x_2 are bodies with masses m_1 and m_2 respectively and the distance between them is d , then x_1 and x_2 attract each other with a force of strength $G \frac{m_1 m_2}{d^2}$.⁶³

In the paradigmatic cases, explanatory links connect one or more explanatory sources (i.e. reasons why *P*) with an explanatory result (the proposition that *P*). I assume that in the cases of essential dependence, metaphysical laws, and laws of nature, the explanatory links can (amongst others) be expressed by sentences of the form ‘ $\blacksquare(P \rightarrow Q)$ ’ or ‘ $\blacksquare \forall x(Fx \rightarrow Gx)$ ’, where ‘ $\blacksquare$ ’ stands for the essence- or law-operators and ‘ $\rightarrow$ ’ is some sort of conditional.⁶⁴ Let us look at the cases of essential

⁶¹ Some of the most pertinent literature includes Fine (2001), Rosen (2010), Schaffer (2009), and the papers in Correia and Schnieder (2012).

⁶² I will for now simply assume that links involving essential dependence normally have the form of E. This assumption will be discussed further in chapters 3 and 4.

⁶³ This is Newton’s law of universal gravitation. See also Kment (2014, 162).

⁶⁴ We will think about the nature of this conditional a bit more momentarily.

dependence and laws first and then consider grounding. As it turns out, there are propositions of the form ‘ $\blacksquare Q$ ’ and indeed plausibly true ones as well. These are unconditional essential propositions, unconditional metaphysical law-propositions, and unconditional laws of nature like the following:

- (E*) It is true in virtue of the essence of disjunction and negation that $P \vee \neg P$.⁶⁵
- (M*) It is a metaphysical law that the empty set exists.
- (N*) It is a law of nature that space-time exists.⁶⁶

For all three proposals, the reader may substitute their favorite examples; theists for example may believe that it is a metaphysical law that God exists, or, more familiar perhaps, that it is true in virtue of the essence of God that they exist. In the following, I will argue that propositions like these (or at least closely related propositions, see section 2.2.3) can be links of empty-base explanations.

But before, we will consider the case of grounding facts, which have a different form than the links just considered. Following Kit Fine (2012) I will (mostly) stick to an operator view of grounding, according to which factive grounding facts are expressed by sentences of the form ‘ $T < \phi$ ’, and non-factive grounding facts are expressed by sentences of the form ‘ $T \Rightarrow \phi$ ’, where ‘ ϕ ’ expresses the groundee and ‘ T ’ stands for a plurality of grounds.⁶⁷ Note that ‘ $<$ ’ and ‘ $\Rightarrow$ ’ are sentential operators that take a plurality of sentences as their left-hand-side argument.

Now, for the case of grounding, considerations that we will look at momentarily have led to the postulation of the phenomenon of *zero-grounding*: Normally, metaphysical grounding is taken to be a relation (or at least something like a relation) between a plurality of propositions or facts, the *grounds*, and a single proposition or fact, the *grounded* fact or *groundee*. Zero-grounding is a limiting case of grounding where the set of grounds is empty. A zero-grounded proposition or fact is grounded and not ungrounded, but it does not require any propositions or facts to ground it – it is grounded in zero propositions.⁶⁸ More precisely, since grounding statements have the form ‘ $T < \phi$ ’, in the case of zero-grounding statements, the ‘ T ’

⁶⁵ For a similar essentialist claim with corresponding explanatory proposal see Glazier (2017b).

⁶⁶ For discussion of this proposal for a law of nature and its explanatory role see Lange (2013a).

⁶⁷ A note on the distinction between factive and non-factive grounding: Statements of the latter in contrast to statements of the former do not entail the truth of their clauses. Like laws of nature, they express an explanatory relation between propositions (or states of affairs) without entailing that the latter are true (or obtain). To give a further approximate gloss on the notion, non-factive grounding statements can be thought of as expressing *potential* factive grounding facts.

⁶⁸ Fine (2012, 47f.).

stands for an empty plurality of grounds. So, statements of zero-grounding have the form ‘ Q ’.⁶⁹

Zero-grounding has first been postulated by Kit Fine (2012, 47f.) who gives a threefold motivation for the notion, namely a metaphor, a technical motivation, and a possible application. Since something at least very similar to his metaphorical motivation can be used to support the legitimacy of empty-base explanation in general, we will turn to it and the applications of zero-grounding shortly.

Fine’s technical motivation goes like this: It is a principle of grounding that true conjunctions are grounded in their conjuncts taken together. Now, it is possible to generalize the notion of conjunction to apply not only to pairs of propositions, but to arbitrary sets of propositions such that a conjunction of a set M of propositions is true iff all propositions in M are true. This generalization gives rise to the *empty* conjunction, i.e. the conjunction of the empty set of propositions which is true iff all propositions in the empty set of propositions is true and hence is true. Then the question arises what grounds the empty conjunction. Fine answers that it is zero-grounded: According to the general principle general explanatory principles stated above that governs the grounds of conjunctions, true conjunctions are grounded in their conjuncts taken together – so, the empty conjunction is grounded in its conjuncts taken together. Thus, it is grounded, but it is grounded in zero propositions. With ‘ $\Lambda\emptyset$ ’ expressing the empty conjunction, Fine’s example for zero-ground and one example for a candidate of the link of an empty-base grounding explanation is this:

(G*) $\Lambda\emptyset$.

While the example might seem somewhat eccentric, the reason for this seems to lie in the idea of the empty conjunction rather than in the idea that (once we have accepted the idea of an empty conjunction) how the empty conjunction is grounded is governed by the same principle as in the case of ordinary conjunctions. The latter idea immediately leads us to the empty conjunction’s being zero-grounded.

In addition to the motivation that Fine gives explicitly, another argument for the existence of zero-grounding can be extracted from his writings. Assuming Fine’s truthmaker semantics account of propositions and grounding, the existence of a zero-grounded proposition is plausible: According to the semantics, there

⁶⁹ For simplicity’s sake I only talk about factive grounding here. The notation for non-factive grounding is analogous.

exists something called the empty state. Fine (2017a, 628f.) defines several kinds of propositions in terms of truthmakers. According to the simplest definition, a proposition is identified with the set of its verifiers. Thus, there exists a proposition which has only the empty state as a verifier; Fine uses the label '*T*' for this proposition.⁷⁰ Fine also defines grounding in terms of truthmaking, part of his account being a definition of grounding on *unilateral regular* propositions. For our purpose, we need not go into detail about what unilateral regular propositions are (for this see Fine 2017a, 628), it is sufficient to know that *T* is such a proposition. Now, Fine's definition for grounding on unilateral regular propositions is as follows:

P weakly grounds *Q* if *P* entails *Q* and *P*₁, *P*₂, . . . weakly grounds *Q* if their conjunction weakly grounds *Q*. *P*₁, *P*₂, . . . strictly grounds *Q* (i.e. grounds *Q* in the customary sense of the term) if (i) *P*₁, *P*₂, . . . weakly grounds *Q* and (ii) *Q* along with any other propositions does not weakly ground any of the propositions *P*₁, *P*₂, . . . (Fine 2017b, 686)

The relevant notion of entailment is defined such that *P* entails *Q* iff the set of verifiers of *P* is a subset of the set of verifiers of *Q*.⁷¹ Now, note that '*P*₁, *P*₂, . . . ' can stand for an empty plurality of propositions. Given the definition, the empty plurality of propositions weakly grounds *Q* if the conjunction of the empty plurality of propositions weakly grounds *Q*. But according to Fine's (2017a, 652) definition of conjunction, the conjunction of the empty plurality of propositions is *T*_□! Hence, the empty plurality of propositions weakly grounds *T*_□, but it also strictly grounds it, because *T*_□ does not weakly ground any of the propositions in the empty plurality of propositions, because there are none.

Coming back to empty-base explanation in general, it now remains to be argued that propositions like our candidates *E*^{*}, *M*^{*}, *N*^{*}, and *G*^{*} can indeed be the links of empty-base explanations. Of course, it is also an interesting question whether there are kinds of explanation, such as causal explanation perhaps, which, for some reason specific to them, do not allow for empty-base explanation. But since my present goal is only to argue that the notion of empty-base explanation in general is legitimate, it suffices to look at the different kinds of metaphysical explanations and explanation involving law of nature. For whether there could be empty-base causal explanation and how this relates to empty-base explanation involving laws of nature, see chapter 5.

⁷⁰ See Fine (2017a, 630).

⁷¹ See Fine (2017a, 649).

2.2.2 Intuition and metaphor

We can arrive at the thesis that propositions like E^* , M^* , N^* , and G^* can indeed be the links of empty-base explanations by metaphorically extrapolating from the use of links such as E , M , N , and G in more ordinary explanations. In the ordinary case, these principles characterize how we can, in some sense, get or move from the base of an explanation to its result. In a sense, for a successful explanation, both base and link are required: We start with the base and arrive at the result with the help of an explanatory principle. Schematically, with ‘■’ as a placeholder for operators such as ‘it is a metaphysical law that’:

Base: P
Link: ■($P \rightarrow Q$)
Result: Q

But now consider E^* , M^* , and N^* : Might the first not explain why $P \vee \neg P$, the second why the empty set exists, and the third why space-time exists? Metaphorically speaking, in ordinary explanations that conform to the above schema, the reasons in the explanatory base and the explanatory link have to work together to explain the result. We can maintain the idea that E^* , M^* , and N^* play a similar explanatory role, but in their case, no help from reasons in the explanatory base appears to be needed:

Base: /
Link: ■ Q
Result: Q

An analogous consideration is available for grounding explanations, which ordinarily have this form:

Base: P
Link: $P < Q$
Result: Q

Again, metaphorically speaking, here the reason in the base and the link have to work together to explanatorily generate the result. But in the case of zero-grounding (for example, of the empty conjunction), no reason is required for the link to explanatorily generate the result from an empty base – from nothing, so to speak:

Base: /
Link: $<Q$
Result: Q

This point can be further supported by adopting a metaphor developed by Kit Fine and Jon Litland (see Litland 2017, 287) to introduce the notion of zero-grounding:

Think of explanation as a machine generating truths from other truths by employing explanatory links. The machine is fed truths (what we have called ‘explanatory sources’ or ‘reasons why’), churning out truths (results) explained by the truths it is fed. A truth is unexplained if the machine never churns it out; a truth is empty-base explained if the machine churns it out when it is fed no input.⁷²

To the extent that this metaphor is adequate, it supports the legitimacy of empty-base explanation. For some discussion of the adequacy of the metaphor see chapter 5.

2.2.3 Explanations trace explanatory links

We can further support the intuitive and metaphorical-extrapolative argument by thinking about the relation between explanations and explanatory links. Given that explanations trace explanatory links, empty-base explanations can be motivated by propositions of the form ‘ $\blacksquare Q$ ’ or ‘ $<Q$ ’, be it unconditional essential propositions, unconditional metaphysical law or law of nature propositions, or zero-grounding propositions. Since essential dependence, metaphysical and natural lawful priority, as well as grounding are all explanatory notions that figure in the link component of corresponding explanations, we can ask what kind of explanation corresponds to unconditional essential propositions, unconditional metaphysical or natural law-propositions or zero-ground propositions such as E^* , M^* , N^* , and G^* . The natural answer is that these are empty-base explanations with unconditional essential propositions, unconditional metaphysical or natural law-propositions, or zero-ground propositions as the link component.

This point can be formulated more generally: Explanation traces explanatory links which feature certain explanatory notions or priority relations. A generalized understanding of ‘relation’ allows not only for two-place and more-place relations,

⁷² This formulation is taken more or less from Litland, but it is extended and amended for the case of empty-base explanation in general. Litland’s original formulation is this: “Think of a machine generating truths from other truths. The machine is fed truths, churning out truths grounded in the truths it is fed. A truth is ungrounded if the machine never churns it out; a truth is zero-grounded if the machine churns it out when it is fed no input” (2017, 287).

but also treats properties as one-place relations. While ordinary explanation can be understood as tracing two-place priority relations between the elements of the base and the result, empty-base explanations can be seen as tracing one-place priority relations.⁷³ Alternatively, as the case of zero-grounding shows, we can understand explanatory priority relations as relating a plurality of explanatory sources (viz. reasons) with an explanandum. As the case of zero-grounding shows, the plurality of explanatory sources can be empty. We have thus a particular (albeit admittedly peculiar) instance of the very same explanatory notion, and should conclude that we deal with some sort of explanation as well. If we adopt this picture, every grounding explanation (ordinary or empty-base) has the following form:

Base: Γ
Link: $\Gamma < Q$
Result: Q

In the case of an ordinary grounding explanation, for example that provided by a rose's being scarlet grounding its being red, ' Γ ' stands for a (non-empty) plurality of grounds (in our case the rose's being scarlet). In the case of a zero-grounding explanation, for example that provided by the empty conjunction's being zero-grounded, ' Γ ' stands for an empty plurality of grounds.

In contrast, matters are less straightforward in the cases of essential dependence and metaphysical and natural law than I have construed them until now, because in the cases of E^* , M^* , and N^* – which I offered as candidates for links of corresponding empty-base explanations – we are (at least) not obviously dealing with an operator relating a potentially empty plurality of reasons with an explanatory result. As I have construed them, laws and essential dependence links have the form of a (possibly quantified) conditional prefixed with an operator. It is possible to treat the operator and the conditional as one operator ' $\blacksquare(\dots \rightarrow \dots)$ ', which relates a plurality of explanatory sources to an explanatory result. Just like in the case of zero-grounding, we could allow for an empty plurality of explanatory sources (or an empty *antecedent* plurality since we are dealing with conditionals). The (unquantified) links in question would then have the following form, with ' Γ ' standing for an empty plurality of propositions:

$$\blacksquare(\Gamma \rightarrow Q)$$

⁷³ Relation talk is to be taken with a grain of salt here and supposed to cover explanatory notions expressed with sentential operators as well. It does not matter here whether talk of explanatory relations is strictly speaking correct or just figurative speech for what is properly expressed using explanatory operators.

These links would have the same form as normal claims of essential dependence and metaphysical and natural law, the difference being that in the case of links of empty-base explanation, ' T ' stands for an empty plurality of explanatory sources. Note though that this would not quite match what I have so far assumed about the form of these links, namely that they are of form ' $\blacksquare P$ ', where no conditionals or empty pluralities are involved. One reaction here would be to revise this assumption, the other to be more lenient on the form these explanatory links can take. Making a decision here would presumably require us to get clearer on the nature of laws and explanation via essential connection. For example, if it turns out that propositions of form ' $\blacksquare P$ ' and ' $\blacksquare(T \rightarrow P)$ ' (with ' T ' standing for an empty plurality) are in some strong sense equivalent, this could count in favor of allowing propositions of form ' $\blacksquare P$ ' as explanatory links. For now, I am content with outlining these options, but we will come back to the issue in the next chapter.

Of course, from the fact that explanations trace explanatory links it does not follow *logically* that each empty-base explanatory link corresponds to an explanation. Nevertheless, assuming that for every ordinary explanatory link there *does* appear to be an explanation that traces it and in light of previous considerations as well as those still to come, it seems appropriate to assume that empty-base explanatory links also correspond to explanations. At least, it is unclear what reason there should be to treat the candidates for empty-base explanatory links systematically differently. Rather, it looks like we are dealing with interesting limiting instances of ordinary explanatory notions such as grounding and should suspect that there is an interesting corresponding limiting case of explanation as well.⁷⁴

One caveat should be mentioned: Not every explanatory link, nor every instance of an explanatory priority relation corresponds to what would count as a *good* explanation in every context or can be used to give an appropriate answer to a related why-question in every context. For example, assuming that the occurrence of the big bang is a cause for a window's breaking, citing the big bang as a cause seems inappropriate as an answer to why the window broke, at least in ordinary contexts. Considerations like this might lead one to suggest that some instances of explanatory notions like grounding, for example links like E^* , M^* , N^* , and G^* , never correspond to *good* explanations, or perhaps correspond to no explanation at all.

My answer to this worry is two-fold: First, the consideration above is too quick, at least in the following two respects: The answer involving the big bang, though in most ordinary contexts not eparticularly satisfactory, may be still *correct* and there presumably are still contexts in which it is even appropriate. Second, in the two

⁷⁴ One potential reason to be skeptical of the inference from the existence of empty-base explanatory links to there being corresponding explanations will be discussed and defused in the next section.

following sections I will argue that empty-base explanations *can* be intuitively appropriate and satisfying. We can partially anticipate the argument: Consider the examples I gave for potential links of empty-base explanations: do they seem to provide – at least for some contexts – satisfactory explanations? If so, the worry from the previous paragraph does not get off the ground. For the case of the zero-grounding of the empty conjunction we can say a little bit more: In this case, the explanatory link is an instance of a general principle of grounding, namely a principle governing the grounding of conjunctions. But if the principle's ordinary instances are granted to provide explanations, there seems to be no good reason to assume differently in the case of the empty conjunction's being zero-grounded.⁷⁵

2.2.4 Explanatory arguments without premises

Jon Litland (2017) motivates empty-base explanation with the idea of explanatory arguments: He first argues for certain conditions under which arguments are explanatory, and then shows that the conditions are satisfied by some arguments which have an empty set of premises; these arguments then correspond to empty-base explanations. In more detail, the argument proceeds as follows: Ordinary arguments have premises and a conclusion. But the notion of an argument allows for arguments without premises, whose conclusions are logical theorems. Furthermore, a subclass of arguments is explanatory in the following sense:

One type of argument is the explanatory argument: if there is an explanatory argument E from premisses Δ to conclusion ϕ , then if Δ is the case its being the case that Δ fully explains its being the case that ϕ . (Litland 2017, 290)

Given these assumptions, there are empty-base explanations if there are explanatory arguments without premises. That there are explanatory arguments without premises can be argued for in several ways. First, we can once more take a look at candidates for explanatory links. Ordinary (viz. non-empty base) candidates (of the non-factive variety) correspond to explanatory arguments. Given that there exist corresponding empty-base candidates such as E^* , M^* , and N^* , it is natural to assume that these correspond to explanatory arguments without premises. Second, Litland provides an argument to the effect that non-factive grounding statements are zero-grounded that proceeds by arguing that there are explanatory arguments without premises for non-factive grounding statements.

⁷⁵ Further responses may be available. For example, in some cases, it can be difficult to intuitively appreciate a perfectly fine explanation.

To argue for the existence of such explanatory arguments, Litland (2017, 289ff.) defines an explanatory calculus – the arguments that can be constructed using only the rules of the calculus are explanatory arguments. At its core, Litland’s argument relies his introduction rule ‘ $\Rightarrow$ -Introduction’ (Litland 2017, 297) for non-factive ground (expressed by ‘ $\Rightarrow$ ’).⁷⁶ According to this rule, whenever there is an explanatory (grounding) argument from premises $\phi_0, \phi_1, \dots$ to conclusion ϕ , there is an explanatory (grounding) argument from these premises to the non-factive grounding claim $\phi_0, \phi_1, \dots \Rightarrow \phi$, which then depends on no premises. Thus, there is an explanatory argument for this claim that has no premises and that informally proceeds as follows: Assume, for introduction of non-factive grounding that $\phi_0, \phi_1, \dots$, infer from this ϕ with an explanatory (grounding) argument and then infer $\phi_0, \phi_1, \dots \Rightarrow \phi$ with the introduction rule for non-factive grounding, discharging the assumptions. This explanatory argument without premises then corresponds to an empty-base explanation. Another application of the introduction rule for non-factive ground reveals the link of this as the non-factive grounding statement $\Rightarrow (\phi_0, \phi_1, \dots \Rightarrow \phi)$.

As I discuss in chapter 5, there is reason to be skeptical about this argument, in particular about whether Litland sufficiently argues for the rule $\Rightarrow$ -Introduction.⁷⁷ For our current purpose, note though that even if $\Rightarrow$ -Introduction should ultimately fail but nevertheless be intelligible, Litland’s consideration would still help to establish the intelligibility of empty-base explanation.

2.2.5 Explanation by status

The next point in favor of the notion of empty-base explanation is that it allows us to more satisfactorily account for a certain explanatory practice than would be possible without it. I will call the kind of explanation in question ‘explanation by

⁷⁶ A note on the distinction between factive and non-factive grounding: Statements of the latter in contrast to statements of the former do not entail the truth of their clauses. Like laws of nature, they express an explanatory relation between propositions (or states of affairs) without entailing that the latter are true (or obtain). To give a further approximate gloss on the notion, non-factive grounding statements can be thought of as expressing *potential* factive grounding facts.

⁷⁷ Note though that there is an interpretation of Litland’s argument which puts less pressure on independent justification of $\Rightarrow$ -Introduction: Litland’s calculus provides a neat logic for iterated ground and the thesis that non-factive grounding statements are zero-grounded solves the ‘status problem’, see Litland (2017, sec. 3), as well as Bennett (2011), deRosset (2013a), and Dasgupta (2014b). The argument for the zero-grounding of non-factive grounding claims using $\Rightarrow$ -Introduction may not be intended as an independent argument based on the independent merit of $\Rightarrow$ -Introduction, but rather as a way to make sense of the idea that non-factive grounding statements are zero-grounded and thus support the overall proposal.

status'. Philosophers have frequently suggested explanations that cite the status of a proposition or fact (for example its modal or essential status, or its lawhood) in order to explain it. There is a great variety of such explanatory claims, for example instances of the following schemata have been proposed (using '[P]' to refer to the fact or proposition expressed by 'P'):

- [P] is explained by the fact that it is naturally necessary that *P*.⁷⁸
- [P] is explained by the fact that it is metaphysically necessary that *P*.⁷⁹
- [P] is explained by the fact that it is a law of nature that *P*.⁸⁰
- [P] is explained by the fact that it is a law of metaphysics that *P*.⁸¹
- [P] is explained by the fact that it is true in virtue of the essence of certain things that *P*.⁸²
- [P] is explained by the fact that *P* is zero-grounded.⁸³
- [P] is explained by the fact that it is very probable that *P*.⁸⁴

Often when stating such candidate explanations, philosophers assert an instance of '*P* because **P*', where '*' stands for the relevant sentential operator that expresses the status in question, such as necessity or lawhood. For instance, Glazier (2017b, 2873) writes that "[an explanation] will not be an essentialist explanation, if it is not of the form '*A* because *t* is essentially such that *A*'". I am skeptical about these instances and I am inclined to deny them (with some, for current purposes, irrelevant exceptions) at least for the cases of metaphysical necessity, essence and grounding on the basis of considerations given in the next chapter.⁸⁵ As a remedy I will argue there that the explanations people are trying to convey by mistakenly invoking instances of '*P* because **P*' should best be understood as empty-base explanations. Thus, the notion of empty-base explanation can make sense of explanatory proposals that appeared problematic when interpreted as

⁷⁸ See, e.g., Lange (2009a) and Lange (2013a). Note: I use 'naturally necessary' and 'physically necessary' in the same sense, but nothing substantial depends on this.

⁷⁹ The idea that metaphysical necessity can have such an explanatory role is widespread, especially in the literature on the question of why there is anything at all and philosophical theology. Notably, Leibniz (1714) can be interpreted as advancing a claim like this. For a more recent proponent see Rundle (2004).

⁸⁰ For claims like this for various kinds of laws see Lange (2009b) and Kment (2014, 161ff.). Lange (2013a) suggests that the question of why there is anything at all might be answerable using a law of nature according to which there is something, e.g. space-time.

⁸¹ See Kment (2014, ch. 6; esp. 146f., 163).

⁸² See Glazier (2017) and Kment (2014, ch. 6; esp. 163).

⁸³ Fine (2012) and Litland (2017) may be taken to advance explanations like this.

⁸⁴ An instance of the schema is suggested by Inwagen (1996).

⁸⁵ See also Kappes and Schnieder (2016).

relying on instances of ‘*P* because **P*’. Note that an advantage of this strategy is that it starts with intuitive judgments about certain explanatory proposals being good, appropriate, or apt to create understanding why, thus supporting the legitimacy of empty-base explanation from a concrete intuitive angle.

One might wonder whether there are instances of empty-base explanation in everyday life or in science. Frankly, with one potential exception, I have not yet encountered good examples and any suggestions would be most welcome. The exception concerns Albert’s and Loewer’s *mentaculus* (cf. Loewer forthcoming), which is, in a very rough nutshell, a framework for a complete physical theory of reality using Boltzmannian statistics. Demarest (2016) suggests that assuming such a framework, the coming about of the microstate of the universe could be seen as a chance event with no prior events. As Hicks and Wilson (2021) have (in effect) pointed out, this would amount to the coming about of the initial microstate having an empty-base explanation involving a probabilistic law of nature (specified according to the *mentaculus*) as its explanator link. We will come back to this proposal in chapter 5.

Perhaps, sometimes, explanation by status, in particular necessary status, is attempted in everyday life as well. If I am right that such attempts at explanations by status are best construed in terms of empty-base explanation, then empty-base explanation (or something that is best construed as empty-base explanation) sometimes occurs in everyday life. In any case, I want to insist that while such examples would certainly help my case, they are not required. Empty-base explanation might only be a philosopher’s kind of explanation and would not thereby suffer in respectability. Here, I am investigating a kind of explanation or explanatory practice that might so far only have been proposed in philosophy, but this does not strike me as a reason to take it any less seriously. It is helpful to consider the case of logical consequence: While some notion of logical consequence surely occurs in everyday life, the generalization of the notion to allow for logical consequences of the empty set of propositions (formulae, etc.) arguably does not occur in everyday life. This does not make the (generalized) notion less respectable or useful for logic and philosophy.

2.3 Empty-base explanation, explaining why, and why-questions

In order to complete the argument for the legitimacy of empty-base explanation, we have to see whether there are corresponding acts of explaining why and how the idea of empty-base explanation relates to the sense of ‘explanation’ in which it denotes an answer to a why-question. Let us start with the latter task and

observe the following problem: Suppose *why-P*-questions indeed must be answered by citing reasons *why P*, as suggested in the previous chapter. Then, given the further assumption argued for in the previous chapter that explanatory links normally are not reasons why their explanandum obtains, and assuming that links of at least some empty-base explanations are normal in this respect, it follows that the links of empty-base explanations cannot provide answers to the relevant *why*-questions. But since the corresponding bases are empty, there are no reasons *why* available that could be cited in answering the *why*-question.

Here, one response would be to – carefully – revise the idea that *why-P*-questions must be answered by citing reasons *why P*. We have already seen that *why*-questions can be answered by *because*-claims, and I have assumed that these are plausibly grounded in corresponding explanatory links. My suggestion is that *why*-questions do not merely ask for reasons *why*, but rather for instances of the reasonhood- or becausal relation, grounded in explanatory links and expressed by *because*-sentences. If there are indeed empty-base explanatory links, then there should be corresponding instances of the becausal relation, which could then be cited as answers to the corresponding *why*-questions.

Another response would be to claim that *why-P*-questions are to be answered by citing sets or pluralities of reasons *why P*. As we have assumed above, in the case of an empty-base explanation, that plurality or set is empty. In the case of a *why-P*-question that is to be answered by producing an empty-base explanation, the set or plurality to be cited as an answer would be the empty set or plurality of reasons *why P*. Note that only if there is an empty-base explanation *why P* – e.g. there is an explanatory link of the required form – would the empty set or plurality of reasons *why P* provide an answer to the question *why P*. If there is no explanation at all *why P*, then while the set or plurality of reasons *why P* in that case is empty as well, it would not provide an answer to the question *why P* on the present account.

However we proceed here, a concern is that while ordinary explanations can be given by way of ‘*because*’-claims which correspond to (or are grounded in) the relevant explanatory links, no such natural language vehicle seems to exist for empty-base explanation. This is because the natural language ‘*because*’ connects two clauses, one expressing an explanandum and the other a reason for the explanandum. But in the case of an empty-base explanation the latter does not exist. My response is that sometimes, ordinary parlance or natural language as a whole does not contain the resources to express legitimate philosophical (or scientific, for that matter) ideas. As an example, it is sufficient to look no further than logical consequence and the natural language expression ‘*therefore*’ which can indicate inferences. Just like ‘*because*’, ‘*therefore*’ is a two-place sentential connective that requires a sentence in its first position to form a sentence. But

this is not a good reason to doubt the legitimacy of the generalization of the notion of logical consequence to allow arbitrary sets of premises – and in particular the empty one. If no worry arises in this case, it is unclear why the analogous worry should arise in the case of ‘because’ and empty-base explanation.

Furthermore, there are ordinary language vehicles that we can at least adapt for the expression of empty-base explanation: First, recall from the previous chapter that there is a broad sense of ‘explains’ in which it can connect the base of an explanation, its link or both with its result. That there is such a sense can be supported by the intuition that in an explanation, the base and the link work together to explain the result. While they have different roles, each does its part in explaining the result and thus (partially) explains the result. That there is such a sense can also be supported by observing linguistic behavior, for example manifested in the philosophical literature on (scientific) explanation, where ‘explains’ is often used in the broad sense.⁸⁶

Second, while I sympathize with the assumption that ‘because’-claims connect the base and the result of an explanation by way of tracking its explanatory link, I want to suggest that people sometimes ignore the distinction between explanatory base and link when trying to convey an explanation by using a ‘because’-claim, thereby using it in a sense analogous to the broad sense of ‘explains’. Thus, it can happen that they mention both the explanation’s base and link or, in the case of empty-base explanation, just the link, after the ‘because’, as sometimes happens when philosophers state explanations by status.

Third, it appears that ordinary parlance *does* know means of either rejecting the need for an explanation, or conveying that no explanation is to be had, for example ‘just because’ in English and ‘darum’ in German. My suggestion is to use such expressions to convey empty-base explanations. Ordinary parlance does not differentiate well enough between conveying the absence of an explanation, rejecting the need for an explanation, and conveying an empty-base explanation. Moreover, ‘just because’ may have not been used previously to express empty-base explanations, but we can of course adapt its use to suit our purposes. We can thus either use ‘ $\emptyset$ ’ to stand for the empty set of reasons why (the empty explanatory base), which gives us ‘. . . because $\emptyset$ ’ to express empty-base explanations (this follows a suggestion by Fine (2012) for the case of grounding), or we can (somewhat tongue-in-cheek) take and adapt the natural language expression ‘just because’, giving us ‘. . . just because’ to express empty-base explanations.

⁸⁶ The most well-known use of ‘explains’ in the broad sense can perhaps be found in Hempel and Oppenheim (1948). Notable recent examples can for instance be found in Lange (2009b).

Thus, if, for example the existence of the universe has an empty-base explanation, then the universe exists *just because*.

While I believe that the required linguistic engineering is perfectly fine, I want to mention one fallback alternative to these considerations about ‘because’, which would involve keeping the assumption that why-*P*-questions presuppose the existence of reasons why *P* and can only be properly answered by citing reasons why *P*. Then, it could be suggested that citing an empty-base explanation could amount to a rejection of the presupposition of the why-question and thus be a good response, while not strictly speaking an answer to it. As I have argued above, empty-base explanations are continuous with normal explanations, and, as I have already suggested and will further argue in the next section, they can be epistemically valuable and can correspond to instances of understanding why. To this end, potential rejections of why-questions on the basis of empty-base explanations differ from pointing out explanatory bruteness and pointing out that an explanation is not required, neither of which are continuous with normal explanations, and neither of which share (everything) that is epistemically valuable about empty-base explanation (although absence of the need for explanation – or in Dasgupta’s (2014b) terms “explanatory autonomy” – if it can be sufficiently accounted for, may do better than bruteness).

We can now address a worry that I have encountered when presenting this material, namely the question whether, rather than being a case of genuine explanation, is what I call ‘empty-base explanation’ perhaps an alleviation of the need for explanation or the achievement of epistemic goals that can be achieved by explanation by a means that is not itself an explanation proper?⁸⁷ My answer is that the considerations above show that empty-base explanations are conceptually continuous with normal explanations. The very same explanatory notions (such as grounding) are involved in normal explanations and empty-base explanations, where they occur in explanatory links of an extraordinary form. Even if we insisted (as suggested in the previous paragraph) that explanations need to cite reasons and hence what I ‘call empty-base explanations’ are not genuine explanations, empty-base explanations would still be continuous with genuine explanations and differ in this respect from pointing out explanatory bruteness or explanatory autonomy.

Let me make some final remarks about how empty-base explanation relates to the just mentioned two ways in which why-questions might be rejected: explanatory bruteness and explanatory autonomy, being two further forms of explanatory fundamentality (while empty-base explained facts are explained, they may be counted as explanatorily fundamental in the sense of being the end of a chain of reasons why). Explanatorily brute facts do not have an explanation and

⁸⁷ Unfortunately, I cannot remember who originally voiced this concern to me.

thus cannot be associated with corresponding epistemic boons such as understanding why. Explanatorily autonomous facts, in some sense, do not require an explanation, which may certainly be an epistemic boon. But first, not much is known about the idea of explanatory autonomy, whereas, on the other hand, once the legitimacy of empty-base explanation has been granted, empty-base explanations are but a special case of explanations that involve the same explanatory notions and can be understood as such.

Second, empty-base explanations may offer explanatory advantages such as unification via the same or similar explanatory links; this does not obviously have an equivalent in the case of autonomy. For the case of grounding, one way this might go is via a connection between grounding and metaphysical law – several instances of grounding, including zero-grounding, may be subsumable under metaphysical laws.⁸⁸ Whether or not laws are involved, some grounding claims including zero-grounding claims are clearly unified by a principle, most prominent is the case of the grounds of conjunctions: Conjunctions, including the zero-grounded empty conjunction, are grounded by their conjuncts.⁸⁹

One of the questions raised at the beginning of this section was whether there are acts of empty-base explaining why. Now, given what I have said so far and what I will say about the epistemic import of empty-base explanation (such as corresponding cases of understanding why) in the next section, there appears to be no reason to doubt that these exist as well.

2.4 Understanding why and epistemic features of explanation why

If we can argue that there are plausible candidates for understanding why that correspond to empty-base explanations, and which acts of giving empty-base explanations could be assumed to aim at, we would also obtain a stronger argument for the legitimacy of empty-base explanation. To a certain extent, this is required: Insofar as explanation why aims at understanding why, much of the interest in empty-base explanation stems from the prospect of obtaining corresponding understanding why.

This task is not completely trivial, since it might be argued that there are cases of explanatory links or instances of explanatory priority relations which do not give

⁸⁸ See for example Schaffer (2018).

⁸⁹ A proper comparison of the notions of empty-base explanation and explanatory autonomy might be an interesting project for another occasion.

rise to understanding why. So my argument for understanding why that corresponds to empty-base explanation has two parts: First, note that the examples and considerations from the previous sections also provide intuitive support to the idea that in some of the relevant cases, there exists corresponding understanding why. The authors referenced in section 2.2.5 offer their cases of explanations by non-conditional law and status as candidates for good explanations, and, when properly grasped, as providing understanding why. Even (at least some of) the zero-grounding proposals have been advanced as delivering good metaphysical explanations why.⁹⁰ Furthermore, if why a conjunction is true can be understood in terms of its conjuncts, then the zero-grounding of the empty conjunction should provide understanding why the empty conjunction is true as well.

The second part of my argument is to look at the nature of understanding why and see whether it allows for a kind of understanding why that corresponds to empty-base explanation. Now Alison Hills' (2016) recent account of understanding why that I will use as an attractive example states that if *S* understands why *P* and that *Q* is why *P*, then:

- *S* believes that *P*,
- *S* has a view as to why *P*,
- *S* has a correct view that *P* because *Q*,
- *S* grasps the/a reason why *P*,
- *S* grasps the explanatory relationship between [*P*] and [*Q*].

Here, the explanatory relationship between [*P*] and [*Q*] is, in our terminology, the explanatory priority relation or explanatory link connecting the two. Hills (2016) states further that if you understand why *P* (and that *Q* is why *P*), then you believe that *P* and that *Q* is why *P*, and in the right sort of circumstances you can successfully:

- follow some explanation of why *P* given by someone else,
- explain why *P* in your own words,
- draw the conclusion that *P* (or that probably *P*) from the information that *Q*,
- draw the conclusion that *P'* (or that probably *P'*) from the information that *Q'* (where [*P'*] and [*Q'*] are similar in a relevant respect but not identical to [*P*] and [*Q*]),
- given the information that *P*, give the right reason why *P*, namely that *Q*,
- given the information that *P'*, give the right explanation why *P'*, namely that *Q'*.⁹¹

⁹⁰ For example, see Litland (2017).

⁹¹ Adapted from Hills (2016).

Hills conceives of understanding why *P* as involving a sort of cognitive control over [*P*], a reason why *P* and the explanatory relationship between the two. She characterizes cognitive control in her sense via the second set of conditions above. Now what Hills says does not immediately bear on the possibility of understanding why for the case of empty-base explanation, because she only considers necessary conditions on understanding why *P* in cases where there is a proposition [*Q*] that is a reason why *P*, but empty-base explanation does not (normally) involve a reason why *P*.⁹² Nevertheless, we can tweak Hills' account such as to arrive at necessary conditions that apply to and allow for understanding why corresponding to empty-base explanations.

Note that the situation of understanding why for the case of empty-base explanation is radically different from that in the case of absent explanation (be it a case of explanatory bruteness or autonomy): In the case of absent explanation, there is no explanatory link to be grasped. On the other hand, while an empty-base explanation why *P* does not provide a reason why *P*, and hence no such reason can or needs to be grasped, it provides an explanatory link ready to be grasped. According to Hills, the grasping of an explanatory link and the cognitive control over it lie at the heart of understanding why. Therefore, it seems there is no obstacle to the existence of understanding why that corresponds to empty-base explanations.

I propose that we help ourselves to an extended version of 'because' (similar to what Fine (2012) suggests for the case of grounding), where the right-hand argument is a (possibly empty) plurality of sentences. Furthermore, I adopt a corresponding refinement for 'that . . . is why . . .', according to which the first argument of this expression is a (possibly empty) plurality of sentences as well. We can thus refine Hills' conditions as follows:

If *S* understands why *P* and that *Γ* is why *P*, then

- *S* believes that *P*,
- *S* has a view as to why *P*,
- *S* has a correct view that *P* because *Γ*,
- if [*Γ*] is non-empty, *S* grasps the reasons why *P* in [*Γ*]⁹³ (in the case of empty-base explanation, there is nothing to be grasped here),
- *S* grasps the explanatory relationship between [*P*] and [*Γ*] (this can be an empty-base link, e.g. a zero-grounding fact).

⁹² More precisely, an empty-base explanation does not involve propositions or facts that play the role of source in that explanation.

⁹³ Let '[*Γ*]' refer to the plurality of facts expressed by '*Γ*'.

Furthermore, if you understand why P (and that Γ is why P), then you believe that P and that Γ is why P and in the right sort of circumstances you can successfully:

- follow some explanation of why P given by someone else,
- explain why P in your own words,
- draw the conclusion that P (or that probably P) from the information that Γ ,
- draw the conclusion that P' (or that probably P') from the information that Γ' (where $[P']$ and $[\Gamma']$ are in a relevant respect similar to but not identical to $[P]$ and $[\Gamma]$),
- given the information that P , give the right plurality of reasons why P , namely $[\Gamma]$,
- given the information that P' , give the right plurality of reasons why P' , namely $[\Gamma']$.

Assuming, as I have argued in the previous section, there are plausible candidates for explanatory links for empty-base explanations, and this seems to allow for corresponding kinds of understanding why. Now, according to my experience, intuitive reactions to candidates for empty-base explanations (such as explanations by status) are varied: Some accept the candidates, at least as making sense as explanatory proposals; others reject the candidates, even just as making sense as explanatory proposals. One way to make sense of the situation is the following: Links of empty-base explanations are (normally) not reasons why their explanandum obtains. The intuitive problems and lack of felt understanding some people experience with proposals for empty-base explanations might be due to an attempt at construing the explanations as normal explanations in which what plays in fact the role of an explanatory link is instead assigned the role of a reason why. The intuitive reservations might recede once the explanatory link is no longer seen as a reason why but properly as an explanatory link of an empty-base explanation.⁹⁴

Explanation why and understanding why are associated with an epistemic boon that I have not yet mentioned. Thus we can further support the legitimacy of empty-base explanation by observing that it can deliver at least some of these as well. For instance, explanation often (if not always) involves increasing the probability of the explanandum by invoking explanatory links: We often ask why P because we are surprised that P . Surprise that P seems to involve a certain conflict of probabilities: When surprised that P , we believe that P , for example because we have strong evidence that P . On the other hand, we assign a low prior probability to $[P]$. This is what surprise often seems to come down to: Something

⁹⁴ This matter will come up again in the next chapter.

turned out to be the case and we came to believe it, even though we assigned a low probability to its turning out to be so. An explanation can then help to increase the probabilistic coherence of our belief-system by showing that the probability of $[P]$ was not as low as we initially thought. For example, Schubach and Sprenger (2011, 108) argue that “hypothesis offers a powerful explanation of a proposition [...] to the extent that it makes that proposition less surprising”.⁹⁵

The legitimacy of empty-base explanation can now be further supported by observing that candidates for empty-base links involving notions of essence, zero-ground, and metaphysical laws can be used just like ordinary explanatory links to play the surprise-reducing role and increase the probability of the explanandum. For instance, once one grasps that it is true in virtue of the essence of some object that P , any surprise that P should cease or at least significantly decrease.

2.5 On the potential and limit of empty-base explanation

In the first part of this section, I will respond to a somewhat fundamental worry about empty-base explanation, namely the question whether empty-base explanations are perhaps epistemically worthless.⁹⁶ The second part takes a look at empty-base explanation vis-à-vis ultimate explanation and the third part lists some examples of applications of empty-base explanation.

2.5.1 What is the epistemic value of empty-base explanations?

In part, an answer depends on what the value of explanation in general is, but I will set aside this general aspect of the question. More specifically concerning our topic, for those who do not immediately see some value in empty-base explanations, the worry can be answered by pointing out valuable applications of empty-base explanation: For example, as we have seen, Litland (2017) proposes that non-factive grounding claims are zero-grounded and thereby solves a problem in the theory of grounding and grounding accounts of physicalism (the status problem). To give but one more example, various philosophers have proposed and taken as important various explanations by status. Insofar as these are best construed as empty-base explanations, the

⁹⁵ Schubach and Sprenger give as further sources for this connection between explanation and surprise reduction Peirce (1931–1935), Hempel (1965), and Glymour (1980).

⁹⁶ I do not recall who originally mentioned this worry to me, for which I apologize.

question seems to be addressed – although, of course, a skeptic of empty-base explanation could try to argue against the value or viability of its applications.

Perhaps the question is better understood as a challenge to demonstrate that the right account of the value of explanation, whatever it is, extends to empty-base explanation in a way that at least sometimes favors it over explanatory bruteness and autonomy. It would surely be interesting to undertake such an investigation, but note first that the applications of, e.g., zero-grounding already constitute an argument for its use and by extension the value of empty-base explanation. Second, I have argued above that empty-base explanations can afford understanding why – but if part of what is valuable about explanation is that it affords understanding why, then the right account of the value of explanation better ensure that it applies to empty-base explanation as well.

We can make a bit more vivid why at least *investigation* of the phenomenon of empty-base explanation might matter for us and our lives besides being a potentially interesting intellectual exercise and besides harboring the potential to quench the thirst for ultimate explanations. Empty-base explanation is relevant partially because it offers alternative explanatory candidates to choose from in applications of inference of the best explanation, especially in the philosophical theological context. More specifically, consider a crude cosmological argument for the existence of God that uses inference to the best explanation: Some apparently unexplained phenomenon is identified, a candidate explanation of the phenomenon that involves the existence or some act of God is described, it is argued that this explanation is the best candidate explanation of the phenomenon, and inference to the best explanation is used to conclude the truth of the explanation and the existence of God.

Now, the relevance of the discussion of empty-base explanation for this type of argument is evident: It has the potential to add a kind of explanation to the mix of candidate explanations that has not been considered before. Note also that at least *prima facie*, the contribution of the notion of empty-base explanation to the discussion of such arguments is different from the contribution of the notions of explanatory bruteness and explanatory autonomy: The notion of empty-base explanation has the potential to contribute genuine explanatory candidates to be considered in application of inference to the best explanation, whereas the notions of bruteness and explanatory autonomy do not. Of course, that is not to say that the latter two notions could not in principle be used to stop the crude theistic argument, nor is it to take a stand on whether such arguments work, or in what other ways they can be critiqued or strengthened. The purpose of my toy argument is to demonstrate the relevance of the

notion of empty-base explanation for similar theistic arguments and applications of inference to the best explanation in general.⁹⁷

Note that empty-base explanation promises to have an impact on more committal (but actually advanced) theistic arguments from the principle of sufficient reason (PSR): Arguable, a proper principle of sufficient reason will have to allow for propositions to be empty-base explained, i.e. for them to be explained in the empty plurality of reasons why they obtain. Thus, the PSR-wielding theist will have to deal with one more rival to God when it comes to how things are ultimately explained.

2.5.2 Empty-base explanation and ultimate explanation

In the introduction I promised that my discussion of empty-base explanation will bear on the issue of ultimate explanation. Now, empty-base explanation allows for the possibility of ultimate explanations in the sense of explanations that do not involve further reasons for which an explanation might be desired, for the simple reason that empty-base explanations why P normally do not involve reasons why P . Furthermore, it allows for explanatory structures S (of facts or propositions) that satisfy the following conditions:

- All facts that occur in S are fully explained (in the inclusive sense referring to both reasons and links) by facts in S .
- S does not contain circles of reasons and S does not contain an infinite chain of reasons – that is, there is no chain in S of facts $f_0, f_1, f_2, \dots$, where f_{n+1} is a reason why f_n obtains for every natural number n .⁹⁸

For example, the zero-grounding explanation of non-factive grounding statements gives rise to such an explanatory structure.⁹⁹ A question that arises is whether

⁹⁷ In chapter 7, I will say more about empty-base explanation vis-à-vis inference to the best explanation.

⁹⁸ This is a stronger condition than necessary if we want the explanatory structure in question to be well-founded: We might for example allow for infinite chains of reasons if all reasons in that chain are explained by reasons (in the structure) that are not part of an infinite chain of reasons.

⁹⁹ While the explanatory structures in question do not involve an infinite regress of reasons why, they do involve what might be called an infinite stair descent. One might wonder whether (and why or why not exactly) this is really less problematic than a straight infinite descent or regress of reasons why. It would be welcome if it is (cf. Bennett 2011), but it is not completely clear how this fact is to be accounted for. The worry then would be that the distinction between reasons why and explanatory links is not as theoretically important as I assume here, thus an

everything could eventually be empty-base explained and thus possess an ultimate explanation: Is there an in principle restriction on what it is to be a candidate for being empty-base explained?

Consider the case of causal explanation, where it seems to be at least *prima facie* the case that any event is at least in principle a candidate effect, viz. it is at least in principle a candidate for being caused. It is questionable whether the same holds, for example, for grounding in general and empty-base explanation involving zero-grounding more specifically. If we assume grounding necessitarianism (i.e. the thesis that grounds necessitate what they ground), then an answer can be given: From necessitarianism it follows that zero-grounded propositions are necessary, hence contingent propositions cannot be zero-grounded.¹⁰⁰

Another idea would be that the zero-grounded propositions have a somewhat formal or ‘thin’ character, which might be reflected in the truthmaking account of grounding, according to which zero-grounded propositions are verified by the empty state. Yet, it is hard to see how to spell this idea out in an informative way: The relevant kind of formal character might just amount to having zero-grounds.

But if we turn to explanations involving laws of nature, the situation might change: First, there is the plausible assumption that the status of laws of nature iterates, i.e. that for every law of nature $\Box_N L$, it is a law of nature that this law is a law of nature: $\Box_N \Box_N L$. Given the idea that the latter explains the former (due to its status as a law of nature), the latter affords an empty-base explanation of the former (for more on this see the next chapter). Second, we have seen above that concrete physical events such as the coming about of the initial microstate of the universe might perhaps be empty-base explained by (probabilistic) laws of nature. Note that due to the laws being probabilistic, the explanandum here can be not only metaphysically but also naturally contingent.

If we combine both ideas, we can get explanatory structures whose initial explananda are concrete physical facts that are ultimately empty-base explained. The required links would be dynamic laws of nature that are empty-base explained using further laws of nature (that in turn are empty-base explained). Chains of reasons why the concrete physical facts obtain terminate in a first reason, namely the initial microstate of the universe (or its coming about), which in turn is empty-base explained.¹⁰¹

account of the difference would indeed be desirable. For present purposes, I suggest rolling with the assumption and letting it earn its keep through theoretical usefulness.

100 But at least one proponent of zero-grounding rejects necessitarianism for their purposes, cf. Muñoz (2020).

101 We will take a closer look at the possibility of empty-base explanation by law of nature and empty-base causal explanation in chapter 5.

2.5.3 Some applications of empty-base explanation

There are plenty of potential applications of empty-base explanation besides making sense of explanation by status and an account of ultimate explanation, and this supports the legitimacy of empty-base explanation. While Litland only explicitly asks what *grounds* grounding statements, it is clear that his account also attempts to answer what *explains* grounding statements: They are empty-base explained, with zero-grounding statements as the links of these explanations. Analogously, empty-base explanation might help to explain other explanatory links such as laws of nature or causal statements – we will come back to this in chapter 5.

Moreover, applications of zero-grounding continue to be proposed: In addition to his empty conjunction, Fine (2012) has suggested that certain truths that have essential status must be zero-grounded since they would otherwise be ungrounded. Linnebo (manuscript) has argued that certain universal statements and related intuitionistic conditionals are zero-grounded. Donaldson (2017) argues that many facts of arithmetic are zero-grounded and Muñoz (2020) argues that zero-grounding plays an important role in grounding negative existential facts. De Rizzo (2020) argues that certain necessities (i.e. propositions of the form ‘ $\Box P$ ’) are grounded in zero-grounding propositions, and Litland (2022) develops a sophisticated account of the grounds of identities, which are zero too.

Finally, as we have seen, Hicks and Wilson (2021) suggest (in effect and following Demarest 2016) that the coming about of the initial microstate of the universe is a chance event with an empty-base explanation by probabilistic law of nature.

In addition to these applications (primarily involving zero-grounding), much of the remainder of this book is concerned with developing further applications of empty-base explanation. Taken together, I believe that the considerations from this chapter as well as the applications to be found in the following chapters provide a compelling case for the legitimacy of empty-base explanation.

2.6 The plan for the remainder of the book

The plan for the remainder of this book is to put the idea of empty-base explanation to work. Thereby we will learn more about empty-base explanation and further argue for its legitimacy by demonstrating its theoretical fruitfulness. The next chapter contains a discussion of what I have introduced above as explanation by status, namely attempts at explaining why P in terms of $[*P]$, where the operator ‘ $*$ ’ expresses some sort of status of P . One upshot of the discussion is that empty-base

explanation can help make sense of this type of explanation, which otherwise is hard to do. In chapter 4, I investigate alternatives to the standard grounding explanations of logical theorems and suggest a kind of empty-base explanation for them. Thereby, I further argue that there are empty-base explanations that do not involve grounding and approach the question of what it takes for an explanatory notion (such as grounding and causation) to allow for a corresponding kind of empty-base explanation. In chapter 5, I further investigate which explanatory links beside grounding facts may be empty-base explained and discuss the possibility of empty-base causal explanation and what we might call ‘zero-causation’. In chapter 6, I investigate the notion of self-explanation and use the idea of empty-base explanation to define a novel notion of self-explanation. I explore the viability of the notion and draw out some historical connections. Finally, chapter 7 discusses the epistemology of empty-base explanation. It discusses the prospects of an abductive epistemology for grounding (including zero-grounding).

Appendix: Making sense of the *empty base* in empty-base explanation

One might wonder (as do for example Rodriguez-Pereyra, Lo, and Skiles (manuscript)) whether we can *really* make sense of the empty plurality of grounds and something at least relation-like holding between it and a groundee – what would it even mean for a relation to hold between nothing (so to speak) and a groundee? The unease here appears to stem from the idea that explanatory links must involve explanatory *relations*, and the thought that, surely, relations must relate *something* with something else.

This unease can be addressed in several ways (I will show this for grounding as an example, but the methods can be applied to other explanatory notions as well). The first presupposes the operator view of grounding; the second the relational view.¹⁰²

Operator views

Above, following Fine (2012), I employed an operator formulation of grounding, and if we assume that, fundamentally, grounding is to be expressed using an op-

¹⁰² Many thanks to Julio De Rizzo for joint work on the material in this section.

erator, the worry above does not seem to get off the ground. But more can be done to defend the intelligibility of zero-grounding given the operator view. For, as far as I can see, one could either object to

1. the intelligibility of sentential operators with an argument position which can take up variably many and in particular zero sentences, or
2. the grounding operator specifically being a sentential operator whose first argument position be filled by variably many and in particular zero sentences (while accepting the intelligibility of such operators in general).

Let me try to relieve these worries in turn. First, it seems that natural language expressions like ‘therefore’ and ‘and’ can be argued to have extensions that allow for saturation of their argument places by zero sentences.¹⁰³ Let me show how the required kind of operator can be intelligibly introduced with the kind of syntactic and semantic clauses commonly used in logic. In particular, let us consider the sentential operator ‘ $\rightarrow$ ’ and understand it as expressing the ordinary material conditional.

The corresponding syntactic clause looks something like this:

If $\ulcorner \alpha \urcorner$ and $\ulcorner \beta \urcorner$ are formulas, then $\ulcorner \alpha \rightarrow \beta \urcorner$ is a formula.

And the corresponding semantic clause would be something like:

$\ulcorner \alpha \rightarrow \beta \urcorner$ is true iff $\ulcorner \alpha \urcorner$ is false, or $\ulcorner \alpha \rightarrow \beta \urcorner$ is true.

Now, these clauses can be straightforwardly extended to allow for *two* sentences in the antecedent, while keeping the spirit of the material conditional:

If $\ulcorner \alpha \urcorner$, $\ulcorner \beta \urcorner$, and $\ulcorner \gamma \urcorner$ are formulas, then $\ulcorner \alpha, \beta \rightarrow \gamma \urcorner$ is a formula.

$\ulcorner \alpha, \beta \rightarrow \gamma \urcorner$ is true iff $\ulcorner \alpha \urcorner$ is false or $\ulcorner \beta \urcorner$ is false, or $\ulcorner \gamma \urcorner$ is true.

So far there appears to be neither a syntactical nor a semantical obstacle to extending the notion in this way. Now, when Fine introduces the notion of zero-ground, he motivates the idea using the notion of a generalized conjunction which can conjoin arbitrary (set-)many conjuncts. Just as Fine did with conjunction when introducing the notion of zero-ground, we can extend the above clauses to allow for ‘ $\rightarrow$ ’ to connect a finite (and possibly empty) list of sentences with another sentence. In keeping with the spirit of the material conditional, the resulting sentence will be

¹⁰³ The existence of the extension of ‘therefore’ is suggested by the assumptions that it expresses logical consequence and that some propositions are logical consequences of zero propositions. For conjunction see the empty conjunction that we have already encountered.

true iff the consequent sentence is true, or at least one of the sentences preceding ‘ $\rightarrow$ ’ is false.

Let us consider the syntactic clause first:

If L is a finite list of formulas $\ulcorner \alpha \urcorner, \ulcorner \beta \urcorner, \dots$, and $\ulcorner \omega \urcorner$ is a formula, then $\ulcorner \alpha, \beta, \dots \rightarrow \omega \urcorner$ is a formula.

Now, with regard to this syntactic clause, there appears to be no issue with allowing for the list of antecedent formulae to be empty. Note that ontological worries about the true nature of lists and whether it allows for an empty list would be misplaced here: We can simply conceive of lists as ordered sets and we can identify the empty list with the empty (ordered) set. What the rule tells us can then be paraphrased as follows: Given a finite ordered set L of formulas, you may write down all the formulas in L in the order that they appear in L , separated by commas – if L is empty, this amounts to not writing down anything – and then write down ‘ $\rightarrow$ ’ and another sentence, and the resulting string will be a formula too.

This is but one means to achieve what can be done in a number of ways: To characterize the syntactic behavior of a two-place sentential operator that may take zero, one, or more sentences in its first position. There may or may not exist such operators in natural language, but there appears to be no *syntactic* obstacle to its existence.

This leaves the semantic clause:

Let L be a (possibly empty) finite list of formulas. Then $\ulcorner \dots \rightarrow \omega \urcorner$ (where $\ulcorner \dots \urcorner$ are the formulas in L) is true iff $\ulcorner \omega \urcorner$ is true, or there is at least one formula in $\ulcorner \dots \urcorner$ that is false.

Note first that this naturally extends the idea of the material conditional to cases where there are three or more sentences in the antecedent: An ordinary material conditional is true iff it is not the case that the antecedent formula is true and the consequent is false. We arrive at the present generalization by moving from ‘the antecedent formula is true’ to ‘the antecedent formulas are all true’.

Understood like this, the idea also naturally generalizes to the case of an antecedent constituted by no formula, i.e. the case of a conditional with nothing in antecedent position and one formula in consequent position: Such a sentence will be true if the consequent is true or there is a false sentence somewhere in its antecedent position. Since there is nothing in its antecedent position, such a sentence will be true iff the consequent is true.

In the present context, we can assume that the extended material conditional (like the grounding connective) does not express (or can be defined in) corresponding

instances of relations.¹⁰⁴ Now, perhaps a definition of the extended material conditional is possible, but no such thing need or should be assumed in this context: Semantic clauses of (logical) operators can often help us (better) understand those operators, help specify their meaning, or help characterize novel related operators without providing definitions or specifying (metaphysical or conceptual) grounds for those operators. To name but two examples, this is true for the truth-theoretical clauses of the classical logical connectives, but it is also widely assumed to be the case for possible worlds semantics for modal operators.

Semantic clauses for ordinary logical operators need not provide definitions, carry any assumption of conceptual priority, or express grounding relations. Therefore, it seems that the extended semantic clause for ‘ $\rightarrow$ ’ need not carry any such assumptions either for us to be able to use it to introduce and understand the extended material conditional and specifically its instances with zero antecedent clauses.¹⁰⁵

Beyond that, it is unclear what more could be reasonably demanded to accept the existence and intelligibility of the extended material conditional. Presumably, even stronger evidence would be provided by identifying a natural language connective that behaves just like the extended material conditional, or by a child that came to acquire it by linguistic immersion. But neither appears to be required – in fact, truth-theoretical semantic clauses are more than is often demanded in philosophy in order for a (either novel or engineered/explicated) notion to be counted as intelligible (at least in the absence of arguments to the contrary). One example here is the notion of grounding itself.

We take the foregoing to provide a good case for the intelligibility of some sentential operators that may take variably many – and possibly zero – sentences in one of their argument positions. Thus, let us come to the second objection: Could the grounding operator be one of those operators?

Aside from what I do elsewhere in this book, I have the following suggestion: At this point, the intelligibility of the generalized material conditional introduced above is granted. But now consider the essence operator and the metaphysical law operator (let us continue to use ‘■’ as a placeholder). Assuming, as appears fair in this context, their intelligibility, we should assume embeddings of the generalized material conditional under such operators to be intelligible too. Thus, for example, formulas of the following form will be intelligible (given the intelligibility of the constituent formulas of course):

104 Some work remains to be done here: The relational worries might crop up again in a higher-order setting. Thanks to Jon Litland for discussion here.

105 Note that further explications of the extended material conditional are plausibly possible. For example, one could extend a specification of the inferential role of the material conditional.

$$\blacksquare(P \rightarrow Q)$$

$$\blacksquare(P, R \rightarrow Q)$$

But embeddings of generalized material conditionals with an empty antecedent under essence operators or metaphysical law operators should then be intelligible too:

$$\blacksquare(\rightarrow Q)$$

Given the importance of the notions of essence and metaphysical law for metaphysics, this is already intriguing in its own right. Additionally, since (as we have seen above) some philosophers have suggested that (at least some) metaphysical laws or essential conditionals back or correspond to metaphysical explanations, this would already support the intelligibility of metaphysical empty-base explanation, i.e. a type of explanation in which an explanandum is explained in zero reasons why, merely in virtue of an explanatory link like $[\blacksquare(\rightarrow Q)]$.

Moreover, it may not be too far from essential and metaphysically law-like conditionals with an empty antecedent to zero-ground, as several authors have offered either definitions of the latter in terms of the former, or at least suggested corresponding intimate connections.¹⁰⁶ While I cannot go into further detail here, these might either allow for a straightforward definition of zero-ground in terms of propositions like $[\blacksquare(\rightarrow Q)]$, or at least make it difficult to maintain the unintelligibility of the former while maintaining the intelligibility of the latter.

Some authors have argued that grounding must be intimately connected to some sort of corresponding generalization such as laws of metaphysics, grounding principles, or grounding rules. Moreover, the literature on explanation and understanding why suggests a key role for (at least an element of) generalization. If so, the above elucidation is a bit too simplistic, because it does not involve *generalized* laws of metaphysics. In chapter 6, I make a suggestion as to what such zero-grounding-friendly generalized metaphysical laws might look like, but see also the recent study of such laws by Litland and Haderlie (manuscript).

Relational views

According to these views, grounding fundamentally is a relation. It may appear *prima facie* strange to talk of relations that hold between nothing on the one hand and something on the other: Should relations not *relate* something with

¹⁰⁶ E.g. Kment (2014).

something? Nevertheless, we can make sense of zero-grounding on a relational picture too:

First, in the case of the relation of logical consequence, instead of claiming that it holds between a (possibly empty) *plurality* of premises and a conclusion, one might opt for it to hold between a (possibly empty) set of premises and a conclusion. Thus, in the case of no premises and logical truths as conclusions, the relation of logical consequence still holds between two entities, namely the empty set of premises and the conclusion. Crucially, there does not appear to be anything obvious blocking the relationist friend of zero-grounding from endorsing a view like this about grounding.¹⁰⁷

Second, grounding, understood as a relation, is usually considered to relate variably many grounds to one groundee: One fact may be fully grounded in another fact, while again another fact may require two distinct facts to be fully grounded. There are ample further examples of such relations, e.g. writing, cooking, fighting with, loving, being members of, etc.

We call relations like these either ‘multigrade’ or ‘variably polyadic’: In the first case, the relation has a constant number of places with variably many positions; in the second, it has variably many places.¹⁰⁸ Grounding can then be understood either to be variably polyadic, or multigrade. On this approach, for zero-grounding to be possible then, there either must be variably polyadic relations that have property-like instances (i.e. just a single place), or there must be multigrade relations that have instance with zero positions in one place. While the latter may be less popular than the former, both have been defended in the literature.¹⁰⁹

¹⁰⁷ Thanks to Benjamin Schnieder for discussion.

¹⁰⁸ Cf. Oliver and Smiley (2013, 162ff.).

¹⁰⁹ For the former, see for example Oliver and Smiley (2004). For the latter, see for example Oliver and Smiley (2013, 111) on what is true of *zilch*, and Oliver and Smiley (2013, 172) for a defense of multigrade predicates. Cf. Rizzo and Kappes (manuscript) for a detailed defense of zero-grounding given the relational account.