Yannic Kappes

Empty-Base Explanation

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Contents

Introduction

Anyone who has spent some time around children or philosophers will be familiar with the following situation: The child or philosopher will ask a why-question and demand an explanation for the fact or phenomenon at hand. If lucky, one will be able to produce an answer, albeit just to be confronted with a further why-question concerning that answer. Then, at some point of this game of why-questions and because-answers, it seems that the interrogee will have to admit their ignorance, claim that at that point there is simply no explanation to be had, dare to spin around in a circle, or embark on an infinite regress and hope that their interlocutor tires before they do.

The interrogee's woes are likely exacerbated if the why-questions concern matters like logical truths, modal and essential truths, explanatory or normative principles, laws of metaphysics or nature themselves, certain axioms or first assumptions, and the existence of various special entities such as the empty set, the world in its entirety or God, or even the existence of anything at all. Matters like these can seem to be particularly stubborn when it comes to their explanation. For some of them, it may not be clear what shape an explanation could take even in principle (sometimes the existence of anything at all is treated like this). Others may appear not to require an explanation, or it can even seem that asking for an explanation is somehow misguided in such cases (for example, this has been suggested for essential truths). Finally, some of these truths may seem to demand a special, in some sense particularly strong, kind of explanation to do them justice.

In a nutshell, the present book develops, explores, and applies a notion of explanation that promises some help for our unfortunate interrogee, namely *empty-base explanation*.[2] While this idea is novel, it is located in the theoretical background of several fundamental and tricky philosophical issues. With respect to these, the investigation of empty-base explanation promises to improve our understanding, helps to better assess existing accounts, and supplies us with promising, novel approaches. To name but one example here, it will be argued that empty-base explanation provides a convincing kind of ultimate or final explanation, i.e. an explanation that completely and conclusively explains a phenomenon without involving other phenomena for which further explanations could be

2 A note on terminology: I have chosen the label 'empty-base explanation' because, as we will see, it reveals a defining characteristic of the kind of explanation in question. In personal communication, Kit Fine has suggested to me the perhaps snappier, but less transparent, 'null-explanation', which by now has been used at least once in print by Hicks and Wilson (2021).

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demanded. As will be shown, the notion of empty-base explanation thereby has a significant import for (amongst others) philosophical cosmology/theology (e.g. the cosmological argument), the debate about the principle of sufficient reason, and the question of why there is anything at all.

To start developing a grasp of the notion of empty-base explanation, observe first that ordinary explanations have a tripartite structure consisting in an explanandum (that which is to be explained), a set of reasons why the explanandum obtains (call this the explanatory base), and an explanatory link or principle that connects the reasons to the explanandum. Together, the explanatory base and the explanatory link make up what is often called 'explanans'.[3] For example, in causal explanations, the explanandum is an effect (e.g. a certain window's breaking), while the explanatory base contains a cause of the effect (e.g. someone's throwing a ball at the window). Causes and effects are then linked by a causal connection or law of nature. Analogously, in (ordinary) grounding explanations, the explanandum is a grounded fact (e.g. a certain rose's being red), the explanatory base contains a corresponding ground (e.g. the rose's being scarlet), and both are linked by a grounding connection or corresponding law of metaphysics.

In contrast, this book argues (focusing primarily, but not exclusively, on non-causal explanations) that there are possible explanations whose corresponding set of reasons is empty – i.e. *empty-base* explanations. Hence, these are explanations that apart from the explanandum (the proposition or fact that *P*) only involve an explanatory link, but no reasons why *P*.[4] Therefore, whereas in ordinary explanations, reasons and explanatory link must work together to explain the explanandum, the link (or explanatory principle) of an empty-base explanation explains the corresponding explanandum without the help of any reasons why the explanandum obtains.

In this respect, an empty-base explanation is akin to (valid) arguments for logical theorems with an empty set of premises: Normally, both premises and inference rules are required to establish a conclusion, but if the conclusion is a logical theorem, inference rules alone can suffice. Arguments are normally taken to be composed of a set of premises and a conclusion, but in logic, it is customary to allow for arguments to have an empty set of premises and correspondingly allow for the notion of logical consequence to hold between an empty set of propositions and a further proposition. This extension of the notions of argument and

3 The concepts and assumptions that underlie the notion of empty-base explanation will be properly developed in chapter 1 and the notion itself will be properly introduced and clarified in chapter 2.

4 As we will see, in special cases the explanatory link can (as part of a further explanation) also be a reason why *P*, but this is the exception, not the rule.

logical consequence are theoretically useful in that they can be used to define the notions of logical truth and theorem: Logical truths are propositions for which a valid argument with an empty set of premises exists; logical theorems are propositions for which a proof from no propositions exists.

It is helpful to think about empty-base explanation in analogous fashion: Explanations why *P* involve an explanatory base, i.e. a set of reasons why *P*, and an explanatory link. Empty-base explanations why *P* are analogous to arguments with an empty set of premises in that they are explanations with an empty base, i.e. an empty set of reasons why *P*.[5]

This book aims to show (using both general considerations from the theory of explanation, as well as concrete applications to a number of topics) that this extension of the notion of explanation is legitimate, philosophically interesting, and theoretically useful. More specifically, it aims to establish that empty-base explanation is possible (more precisely and cautiously it will be argued that the nature of explanation allows for there to be empty-base explanations), explores applications of empty-base explanation, provides a better understanding of empty-base explanation by investigating varieties of empty-base explanation, as well as what it takes for an explanatory notion such as grounding or causation to have a corresponding kind of empty-base explanation, and investigates the epistemology of empty-base explanation. An important conceptual precursor of the notion of an empty-base explanation is Kit Fine's (2012) notion of zero-grounding. One aim of this book is to provide the literature on zero-grounding with a more solid theoretical footing.

In the following I provide an overview of the book's chapters. While each chapter contributes to the book's overall argument, it is possible to read chapters 1 and 2 to acquire an understanding of the notion of empty-base explanation and then pick from the other chapters which can be read mostly independently of each other.[6]

5 The analogy is from deRosset (2013b) and Litland (2017) – we will come back to it repeatedly, starting with chapter 2.

6 While I introduce the required standard notions (e.g. essence and grounding) and technical devices of contemporary metaphysics presupposed by the discussion, the reader might additionally want to refer to Fine (1994) for the notion of essence, Fine (2012) for the notion of grounding, and to Rosen (2010) on grounding and essence. Good further sources can be found in the collection Correia and Schnieder (2012) and the ubiquitous *Stanford Encyclopedia of Philosophy*.

Chapter 1: Preliminaries

This chapter establishes the framework for the project by introducing several important notions such as explanation, grounding, essence, laws of metaphysics and laws of nature, and then defending some required assumptions (such as the tripartite account of the structure of explanation, cf. Schaffer 2017) about these notions, why-questions and because-sentences, reasons why and understanding why.

Chapter 2: Introducing Empty-Base Explanation

This chapter introduces the notion of an empty-base explanation and argues for the possibility of empty-base explanation by

(a) invoking general considerations concerning the nature of explanation such as the tripartite account of explanation, the connection between explanation and explanatory arguments, and the form of propositions involving explanatory notions,
(b) offering plausible candidates for empty-base explanations,
(c) exploring its connection to the speech act of explanation, because-sentences and understanding why,
(d) presenting and discussing a conceptual precursor of empty-base explanation, namely zero-grounding (introduced in Fine 2012), as well as some of its discussion and suggested applications (for example due to Litland 2017, Muñoz 2020, De Rizzo 2020, and Litland 2022), and
(e) considering its epistemic value and connection to the idea of ultimate explanation.

Parts of this chapter are based on Kappes (2020a), Kappes (2020b), and Kappes (2022).

Chapter 3: Explanation by Status

This chapter investigates *explanation by status*, an alleged kind of explanation in which – roughly speaking – a fact is explained by its having a certain status, such as its being a necessary or essential fact. The chapter

(a) discusses several problems for explanation by status,
(b) argues that proposals for explanation by status are best construed as proposals for empty-base explanations and applies this idea to some proposals

for explanations by status (e.g. concerning the explanation of law-like regularities and certain answers to the question of why there is anything at all),
(c) argues that the account is superior to Glazier's (2017b) alternative approach,
(d) applies the account to argue that while explanation by essential or law-status is possible, explanation by necessary status or mere high probability (cf. van Inwagen 1996) is not. An account of probabilistic empty-base explanation is proposed and compared with a recent idea by Hicks and Wilson (2021). And finally, the chapter
(e) suggests how the account may be able to elucidate the explanatory connection between laws and the corresponding universal generalizations: Each law figures as a link both in ordinary explanations and in an empty-base explanation of its corresponding universal generalization.

By so linking empty-base explanation with explanation by status, a further application of empty-base explanation is identified which supports the legitimacy of both empty-base explanation and (some forms of) explanation by status. Parts of this chapter are based on Kappes (2020a) and have grown out of joint work with Benjamin Schnieder in Kappes and Schnieder (2016).

Chapter 4: Explanation of Logical Theorems

This chapter expands on the discussion of empty-base explanation by discussing candidates for explanatory notions that may allow for empty-base explanations of logical theorems that go beyond the grounding explanations to be found in the literature.[7] It argues that the standard grounding explanations of logical theorems on their own are unsatisfactory and that the existence of an empty-base explanation of logical theorems would be preferable. The chapter implements this idea by
(a) discussing the prospect of zero-ground explanations of logical theorems,
(b) developing a notion of explanation based on Yablo's (2014) idea of reductive truthmaking and argues for an empty-base explanation of logical theorems based on this notion, and
(c) turning to a notion of explanation based on essence and metaphysical laws and to an explanation of logical theorems in terms of their status as essential truths and metaphysical laws, to be understood as an empty-base explanation

7 See, e.g., Schnieder (2011) and Fine (2012).

along the lines of chapter 3. An application of this notion in the philosophy of mind is suggested.

Parts of this chapter are based on Kappes (2020a).

Chapter 5: Causation Ex Nihilo: Could There Be Empty-Base *Causal* Explanations?

This chapter investigates whether and why there could (or could not) be empty-base *causal* explanations. In more traditional terms, this amounts to an investigation of the notion of *causation ex nihilo*. The issue is of considerable interest in its own right, but even more so in the present context because if empty-base causal explanation is not possible, we better have a good account of why empty-base explanation in general (or at least of the metaphysical sort) remains possible. The chapter investigates the possibility and potential application of causal explanations with an empty base and empty-base explanations by law of nature by

(a) developing an account of why certain explanatory relations may allow for corresponding empty-base explanations while others do not,
(b) arguing that Litland's (2017) argument for the zero-grounding of non-factive grounding claims generalizes to laws of nature and possibly non-factive causal claims,
(c) using these findings to propose an empty-base explanation of laws of nature and possibly causal claims, thereby taking some steps towards addressing a recent challenge by Kovacs (2022), and finally
(d) evaluating the possibility of empty-base explanation by law of nature with a dynamic (i.e. temporal) character by (1) discussing a recent example for such an explanation identified by Hicks and Wilson (2021), and (2) offering thoughts on the form of the required laws and potential test cases.

Chapter 6: Self-Explanation

This chapter investigates the possibility of *self*-explanation. The findings of chapter 1 are used to differentiate between self-explanations in a restrictive and in an inclusive sense; the inclusive notion is then defended against several arguments and the results are applied to solve a grounding problem for Humeanism about laws of nature (cf. Loewer 2012 and Lange 2013b). The inclusive notion of self-explanation is then combined with the notion of an empty-base explanation to define a notion of self-explanation that bears some resemblance to the idea of

rule-circular justification. The notion is defended against Kovacs' (2018) arguments against self-explanation, and its applications to the question of iterated grounding, the idea of explanatory self-subsumption (cf. Nozick 1981, 119ff.), the debate about the principle of sufficient reason and necessitism, and historical ideas from philosophical theology (from Aquinas and Spinoza) are explored. This chapter is based in part on Kappes (2022).

Chapter 7: The Epistemology of Empty-Base Explanation

This chapter explores the epistemology of empty-base explanation. Several methods by which empty-base explanations may be established are discussed (some of which are employed in the literature on zero-grounding, e.g. by Fine (2012) and Litland (2017)) and inference to the best explanation (IBE) is identified as a particularly interesting candidate. Its use in metaphysics is explored and an account is formulated that allows for grounding claims and laws of metaphysics in general, but most notably metaphysical empty-base explanations to be established by IBE. A distinctive problem for abductive methodology stemming from zero-grounding claims and empty-base explanation more generally is established and then addressed.

As this overview makes apparent, the phenomenon of empty-base explanation is investigated from a number of angles. An additional thread that runs through the following chapters is how what is developed therein bears on issues surrounding certain notorious philosophical why-questions and the kind of special explanatory answers that they seem to demand. As an example, consider the question of why there is anything at all.

Arguably, not every correct answer to the question 'Why is there something?' is a satisfactory answer to the question 'Why is there anything at all?': One correct answer to the question of why there is something consists simply in a because-claim that cites the existence of a particular thing, for example 'There is something because Proxima Centauri exists', but this hardly seems to be the profound answer to the question some philosophers have desired when asking why there is anything *at all*.[8]

Two respects in which explanations can be profound are particularly important here: First, explanations may be required that eliminate involvement of certain concepts or entities. For example, when asking why there are any giraffes at all, answering by giving reasons that involve giraffes (e.g. by pointing out that giraffes in the past procreated and brought about present giraffes) will plausibly

8 Cf. the recent collections Goldschmidt (2013) and Leslie and Kuhn (2013) on the topic.

frustrate the inquisitive interests we had when asking the question. Rather, what seems to be required is an answer that can do without reasons that involve any giraffe whatsoever (for instance an evolutionary story of how giraffes came about). Similarly, when asking why there is anything at all, an answer may be desired which does not involve reasons that involve existence or any existents whatsoever (whether such an answer could in fact be given need not occupy us here).

The second respect in which an explanation can be profound that concerns us here is ultimacy. Ultimate explanations, as I use the term, are explanations that, in some to be specified sense, do not give rise to further why-questions or further need for explanation.[9]

Empty-base explanation promises to deliver on both counts: Since empty-base explanation allows explaining why *P* without involving reasons why *P*, empty-base explanations allow – in principle – to eliminate any concept whatsoever that occurs in the explanandum from the reasons involved in the corresponding explanans, because the explanans of an empty-base explanation why *P* only consists in an explanatory link, but in no reasons why *P*. For example, if there were an empty-base explanation of why there are giraffes, then this explanation would not involve any reasons why there are giraffes and hence explain the existence of giraffes without reasons that involve giraffes.[10]

With respect to ultimacy, empty-base explanations promise to deliver because they are explanations that do not involve reasons why for which the question why they obtain arises. Thus, empty-base explanations as they will be introduced in chapter 2 allow to terminate chains of reasons why without leaving any reason why in the chain unexplained. The discussion in chapter 3 further bears on issues of ultimate explanation and the question of why there is anything at all, because (as we will see) several philosophers have suggested that explanations by status – especially necessary status – are in some sense ultimate explanations that afford satisfactory answers to the question why there is anything at all. Thus, both the

9 For more discussion of these matters see Kappes and Schnieder (2016).

10 Spelling out the intuitive understanding of involvement that I rely on here is not completely straightforward. For example, note that we can satisfactorily answer why there are giraffes at all while using explanatory links such as causal links that do in *some* sense involve giraffes (or the concept of giraffes). To wit, consider an explanation that uncovers the existence of non-giraffe ancestors of giraffes and the causal link that runs from them to some giraffe. Such an explanation would seem to provide a satisfactory answer to the question of why there are any giraffes at all. But then, if, as seems plausible, the explanation why there are giraffes at all should do without involvement (in the relevant sense) of giraffes in both reasons and explanatory link, then the sense in which giraffes are involved in the causal link in the above explanatory candidate cannot be the relevant sense.

criticism of explanation by (necessary) status as well as the constructive suggestion of chapter 3 to reconceive of explanation by status in terms of empty-base explanation are relevant to this topic.

Chapters 4 and 5 bear on the matter of ultimate explanation and the question of why there is anything at all insofar as they explore what kinds of explanation besides grounding explanation allow for empty-base explanation. Some philosophers (e.g. Nozick 1981, 115ff.) believe that only self-explanations can be truly ultimate explanations. Indeed, even an empty-base explanation involves an explanatory link which may give rise to the question why it obtains. Chapter 6 addresses this issue by exploring the viability of a notion of self-explanation that can be defined using the notion of empty-base explanation. Lastly, in the literature on the question why there is anything at all, a variety of answers have been argued for by (apparently) inference to the best explanation.[11] The discussion in chapter 7 bears on this matter insofar as it undertakes some steps towards an account of this abductive practice, while pointing out difficulties that the relevant abductive inferences face.

Finally, a word of caution: As an exercise in conceptual explication and engineering, the following material might eventually skim the edge of conceptual coherence. It will be my task to argue how far we can go, and it will be up to the reader to decide how far they wish to come along. But rest assured, while I defend the possibility of explanations why without reasons why, I do not aim to do so without reason.

11 For example, the application of inference to the best explanation is implicit in the works of Rundle (2004) and Rescher (2016).

1 Preliminaries

This chapter lays the ground for the rest of the book by introducing some important notions and assumptions. The first section differentiates and clarifies at least some of the many meanings of 'explain' and 'explanation'. The second section introduces an important distinction between different constituents of explanations: They possess a tripartite structure of explanandum (that which is explained), an explanatory base constituted by explanatory sources (i.e. reasons why), and an explanatory link that connects the base to the explanandum. Together, the latter two components constitute what is often called the explanans. The third section takes a look at why-questions, their answers and the notion of a reason, as well as their intimate relation to explanation in our sense. The fourth section defends some of the assumptions from the preceding sections against criticisms from the recent literature.

1.1 Explanation

Let us start by clarifying some of the many meanings of 'explain' and 'explanation'. Following Benjamin Schnieder (2015, 137f.), we can differentiate a primary sense in which 'explain' and 'explanation' denote a communicative act of explaining, and secondary senses in which 'explanation' either denotes the linguistic vehicle of an act of explanation or the content expressed by such a vehicle. Let us call these senses the 'act sense', 'vehicle sense', and 'content sense', respectively. We say that the primary sense is *primary* to the secondary senses because the secondary senses can be characterized (as we just did) in terms of the primary sense. On the other hand, as we will see shortly, the reverse is not straightforwardly possible.

Next, following Sylvain Bromberger (1992, 20), we can observe that for different 'wh-'-interrogatives, there are different corresponding explanations. For example, it can be explained *what* something is, *how* something is done, or *why* something is the case:

– They explained to me what the four color theorem is.
– She will explain how the car can be repaired.
– I can explain why the window is broken.

In the following, I am exclusively concerned with explanation why. Accordingly, and in line with much of the literature on scientific explanation, I use 'explain' and 'explanation' as short forms for 'explain why' and 'explanation why', unless noted otherwise.

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With the distinction between different explanations wh- in place, we can apply the distinction between the act sense, vehicle sense, and content sense to explanation why. To give some more examples in addition to the third example above, the act sense is salient in the following cases:

– I explained why salt dissolves in water.
– Please explain to me why you did this!
– Their explanation why they arrived late took forever.

Concerning the vehicle and content senses, note that one linguistic vehicle of acts of explanations why are because-sentences: Explanations why are often performed by making because-claims. So I will assume that in the secondary senses, 'explanation' can refer to because-sentences or their contents.[12] Since at least part of giving an explanation why *P* consists in answering the question why *P*, and because-claims are one means of doing this, we can generalize this and assume that explanations in the vehicle and content senses are answers to why-questions and their contents. Of course, because-statements are but one means of answering why-questions, some others being statements of the form 'The reason why *P* is . . .' and 'A reason why *P* is . . .'.[13]

The distinction between the act sense of explanation and its vehicle and content senses is reminiscent of Bromberger's (1992, 50) distinction between the performance sense and text sense of 'explanation', as well as Ruben's (2004, 6) distinction between its process sense and product sense, which he also finds in terms like 'prediction', 'argument', and 'statement'. While it is not perfectly clear what Ruben means by 'product sense', it is plausible to assume that it refers to the information conveyed by an explanatory act. It is instructive to think about whether this information is the same as what is expressed by the corresponding answer to a why-question. In other words, do the content sense and Ruben's product sense of 'explanation' refer to the same thing?

Plausibly, they do not, because explanation why at least sometimes requires the communication of more than merely an answer to a why-question.[14] Following Skow (2016) I will argue in section 1.3 that correct and complete answers such as 'The reason why *P* is that *Q*' to a why-question 'Why *P*?' need not have as part of their content information about a law or explanatory relation connecting what

12 Cf. Schnieder (2015, 137f.).

13 Cf. Bradford Skow (2016, 13ff.), who also argues that there is a sense of 'explanation' under which it denotes answers to why-questions. We will discuss answers to why-questions and their relation to explanation in more detail in section 1.3.

14 Cf. Bromberger (1992, 41f.).

'*P*' and '*Q*' stand for. For example, plausibly, a correct and complete 'The reason why *P* is that *Q*'-answer need not have as part of its content something that determines whether the explanatory relation is one of causation or grounding, let alone anything more specific.[15] Nevertheless, it can be argued that such information needs to be conveyed by corresponding acts of explanation why because these acts aim at creating understanding why in the addressee.[16] Now arguably, understanding why requires grasping some sort of explanatory relation or law such as a causal or grounding relation.[17] But then an act of explaining why should communicate this explanatory relation or law. If Skow is right about answers to why-questions, this will involve more than providing the answer to the relevant why-question.

In any case, whether or not it is correct that information about laws or explanatory relations must be part of the content of answers to why-questions, merely *telling* people a correct and complete answer to a why-question does often not seem to amount to explaining it, even if information about the relevant laws or explanatory relations is also conveyed, as examples like the following suggest:

> A (bad) teacher distributes a list of sentences which their students have to learn for the next exam. The sentences concern various topics, and one of them reads 'The heavenly bodies $a_1, \ldots, a_n$ move as they do because their masses are $m_1, \ldots, m_n$ and their locations are $l_1, \ldots, l_n$'. Another of the sentences expresses a complex law of gravitation that relates masses and locations of heavenly bodies to their movement. We can imagine the students as either not quite possessing the concepts required for grasping the law of gravitation or otherwise possessing the concepts but lacking a proper grasp of the law because of its mathematical complexity. The teacher does nothing to address this.

It seems in this situation the teacher has *told* the students (correctly, let us assume) why the heavenly bodies move as they do, but the teacher has not *explained* why

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15 Grounding is a notion of metaphysical productive priority involved in metaphysical explanations that has gained much attention in recent years and will play a pivotal role in what follows. I will make explicit what I assume about grounding along the way; for now, it is sufficient to know that it plays a role in metaphysical explanations that is roughly analogous to that of causation in causal explanations (although, as I will argue below, there is reason to assume that there are metaphysical explanations that involve other explanatory relations than grounding). For accounts of grounding see for example Rosen (2010), Fine (2012), the introduction by Correia and Schnieder (2012), and Bliss and Trogdon (2016). As for metaphysical explanations, we will encounter many examples over the course of this book, but examples include the idea that the mental can be metaphysically explained by (and hence grounded in) the physical, that the normative can be metaphysically explained by the non-normative, and that the existence of wholes (or sets) can be so explained by the existence of their parts (or members).

16 See for example Bromberger (1992) and Achinstein (1983).

17 See Hills (2016).

the heavenly bodies move as they do. The point is not that episodes of explaining can only be called such if they are successful. Rather, the point is that the communicative act of explaining why involves more than mere telling why: Perhaps for explaining why, the teacher would have to provide additional information, such as a visualization of the relationships captured by the law of gravitation. The teacher might also have to provide something else, such as an action that helps the addressee grasp the answer properly and gain understanding why; this could perhaps be a slow, emphatic reading or an instruction (on how) to properly reflect on the law of gravitation. If the former is true, the content sense and Ruben's product sense do not refer to the same thing.[18]

Note first that if the latter is true and it is not additional information but something else that is required for an explanation in the above cases, this would provide a reason to understand Ruben's 'product sense' differently, namely as referring to a sense of 'explanation' under which it refers to the information conveyed by an explanatory act plus whatever is further required, for example an action that helps the addressee grasp the answer and gain understanding why.[19] Note second that we can differentiate partial and full explanations: Often when we explain why *P*, we only provide part of a full explanation, for example if a full explanation would be needlessly complex and the missing parts are taken to be understood, or if we only know how to partially, but not fully explain why *P*.[20] Now, in the example, the teacher might have *told* the students a complete – full – answer as to why the heavenly bodies move as they do, but nevertheless the teacher would not have given an explanation why the heavenly bodies move as they do.

The distinction between explaining why and telling why also serves to further explain in what sense the act sense is primary and the vehicle and content senses are secondary: As we have seen, the secondary senses can be derived from the act sense, but not vice versa, at least not straightforwardly, since the linguistic vehicles of acts of explanation and their contents can also serve as vehicles and contents of other communicative acts such as acts of telling why. I will further discuss answers to why-questions and their relation to explanation why in sections 1.3 and 1.4 below, but for now we have to attend to yet another sense of 'explain', in which it denotes a relation that holds between entities such as

18 The point concerns explaining and telling in general; for instance, explaining what something is or how something is done involves more than mere telling what something is or how something is done.

19 On the difference between telling why and explaining why see also Skow (2016, 8) and Bromberger (1992, 41f.), who develops an account of the act of explaining.

20 See Ruben (2004, 29f.).

propositions, facts or events. This relational sense of 'explain' is salient in the following examples:

- That Moriarty threw a ball at the window explains why it is broken.
- The law of gravity explains the motion of planets.
- My being in a certain brain state explains that I am in a certain mental state.
- My being in a certain brain state together with the relevant psycho-physical laws explains my being in a certain mental state.
- That the ball is red is partially explained by a metaphysical law stating that everything that is scarlet is red.[21]
- That Moriarty's throwing the ball caused the window to break explains why it is broken.

Note that formulations using 'explains why' can be reformulated without using the word 'why' and vice versa. Also, all of the above are naturally interpreted and intended as explanations why. I assume that there is a good sense of 'explain' according to which all of these are good candidates. To foreshadow a little, there is potential to be skeptical about the cases involving laws or causation on the left-hand side, but for now it is sufficient to assume that laws or instances of causation are *somehow* involved in the corresponding explanations; I will say more about how exactly in the next section. Whether the relational sense or the sense in which 'explain' denotes a communicative act is salient is normally obvious from the context as well as the involved relata, which will be discussed momentarily.

Some more conventions will be helpful: Let us use '[explain]' to refer to the relation denoted by the relational sense of 'explain' in the examples above; we use 'explanandum' in its ordinary sense to refer to that what is explained, viz. the second relatum of [explain] and we use 'explanans' in its ordinary sense to refer to that which 'does the explaining', viz. the first relatum of [explain]. Note that talk about [explain], i.e. the relation referred to by 'explain', should not be conflated with talk about what is sometimes called 'explanatory relations', such as causation or grounding. We will see in the next section how the two relate to each other. Using these conventions, we can differentiate two further senses in which 'explanation' is occasionally understood: First, it may refer to the explanans. Second, as we will see at the beginning of the next section, it may refer to explanandum and explanans taken together; in this respect it resembles 'argument' which standardly refers to a whole

21 Like the notion of grounding, the notion of a metaphysical law will be important in what follows. For present purposes it is sufficient to think of metaphysical laws in analogy to laws of nature: The latter play a certain role with respect to causal explanations, while the former play an analogous role with respect to metaphysical explanations. For an account of metaphysical laws see Kment (2014).

composed of premises and conclusion, but which outside of philosophical contexts appears sometimes to be used to refer only to the premises of an argument in the first sense.

Not least to be able to conveniently talk about the relata of [explain], I need to say a little bit about what kind of thing they are – what are the kind of things that (in the relational sense) explain what kind of things? Several answers are suggested in the literature, the main candidates being events, facts, and true propositions.[22] I would like to remain as neutral as possible here, but I will assume that the relata of [explain] at least usually are facts or true propositions. This assumption is widespread and it seems clear that, at least very often, [explain] does not relate events, because no candidate events exist, for example in purely mathematical explanations, or when the explaining entity is a law.[23] For what it is worth, most of this book will deal with various forms of non-causal or metaphysical explanation, in the literature on which it is widely assumed that the explanatory relata are facts or true propositions.[24]

In what follows, I will often use only one of the terms 'fact', 'true proposition' or 'truth' instead of using all of them. Unless noted otherwise, this is merely for style and convenience, and the reader may pick their favorite kind of explanatory relatum. Furthermore, I need a device to refer to the explanatory relata that are expressed by sentences or sentence letters. For this, I use square brackets: The expression obtained by flanking a sentence or sentence letter with square brackets refers to the proposition or fact expressed by the sentence or sentence letter within the brackets. For example, '[*P*]' refers to the proposition or fact expressed by '*P*' and '[The sun is shining]' refers to the proposition or fact expressed by 'The sun is shining'. The proposition-referring and fact-referring uses will be disambiguated when necessary.

Note that there are uses of 'explain' that seem to have completely different relata. For example, it is fine to say 'Moriarty's anger explains the broken window', given that Moriarty's anger caused him to smash the window. I assume that what is or should be meant by these variants are instances of [explain] relating truths or facts as well – in our case the more perspicuous reformulation is 'That Moriarty has been angry explains why the window is broken'. If there are cases in which

22 Cf. Ruben (2004, 160ff.).

23 For an argument that it is facts and true propositions but not events that explain and are explained, see Ruben (2004, 160ff.). It may be worth pointing out that Kim (1994, 68) holds that explanation involves events that are related by dependence relations, but Kim's events are fact-like structured, see Kim (1976).

24 See for example the papers in Correia and Schnieder (2012).

such a reformulation is not possible – perhaps in cases of agent-causation and the corresponding explanations, if such are possible – then I am not concerned with them.[25]

Some remarks are in order: First, Schnieder (2010) provides some evidence that the relata of [explain] have to be individuated more finely than facts and propositions normally are, namely to account for certain conceptual explanations. I will ignore this complication unless it becomes relevant. Second, commitment to relata of [explain] and the question of what kind of entity they are might possibly be avoided by adopting an operator view of 'explain', in analogy to what Fine (2012) proposes for the case of grounding: Instead of using a relational predicate 'explain' that connects singular terms that refer to facts or truths, an operator formulation involves a sentential operator that connects two sentences that correspond to the facts or truths referred to in the relational formulation. In that case, just as in the case of grounding, the relational predicate 'explain' will merely be a convenient means of expressing what could be more perspicuously expressed using the explanatory operator. Note that, indeed, 'because' *could* be considered to be such an operator, but in the following two sections I will argue that it has a related, yet different role. Third, some authors (cf. Lipton 1990) argue that explanation is irreducibly contrastive, which requires [explain] to have contrast classes as additional relata, which are classes of propositions or states of affairs. According to this view, rather than being expressed by a two-place predicate '. . . explains . . .', the relation [explain] is more perspicuously expressed by a four-place predicate '. . . rather than . . . explains . . . rather than . . .'. I will say a bit more about contrastivity in the following sections.

Recap of the main points of this section: There are different kinds of explanations wh-, and this book focuses on explanation *why*. There are a number of senses of 'explain' and 'explanation': The act sense, vehicle sense, and content sense. In its vehicle and content sense, 'explanation' denotes answers to why-questions, such as because- and 'reason why'-statements. *Explaining* why *P* requires *answering* why *P*, but perhaps more information needs to be conveyed and more than merely an answer why *P* needs to be given. Furthermore, there is a relational sense of 'explain' and corresponding notions of explanans and explanandum, as well as a sense of 'explanation' in which it refers to explanans and explanandum taken together. I assume that the relata of the relation expressed by 'explain' are true propositions or facts.

With these preliminaries in place, it is natural to ask for more information concerning how explanatory acts, answers to why-questions, and the relational

25 For an introduction of the notion of agent-causation see Clarke and Capes (2017).

sense of 'explain' relate to each other. I postpone discussion of this question until section 1.3 and first look at two different roles in which propositions or facts can occur in explanations.

1.2 Sources and links

With respect to the roles that facts can have within an explanation, I have already mentioned the traditional distinction between the explanandum – that which is explained – and the explanans – that which does the explaining. But finer, more informative distinctions can be made. Thus, according to Jonathan Schaffer, explanation has a tripartite structure:

> Explanation has a tripartite structure of sources, links, and result. With causal explanation, there is the structure of causes (such as the rock striking the window), laws (laws of nature), and effect (such as the shattering of the window). Metaphysical explanation has a parallel structure, involving grounds (the more fundamental sources), principles (metaphysical principles of grounding), and grounded (the less fundamental result). (Schaffer 2017, 3)

This tripartite view identifies two roles that facts that belong to the explanans may have: in Schaffer's terms, those of *sources* and *links*. To add a little terminology whose utility will become apparent later, let us call the sources of an explanation taken together its *base*. In the case of causal explanation, the distinction is particularly clear: Laws are not causes and vice versa; nevertheless, they are both – in different roles – involved in causal explanations.[26] The rough distinction supported by examples like Schaffer's seems intuitively clear, and, indeed, if not in Schaffer's terminology, something like the distinction between sources and links is widely recognized in the literature on explanation:

- The covering law model of explanation distinguishes laws and initial conditions which together constitute the explanans.[27]
- According to Lewis's (1986a) theory of causal explanation, the explanation of a particular event involves causes, effects, and relations of causal dependence holding between them.

26 I assume here for this case (and without loss of generality) following Schaffer that it is laws (rather than individual instances of, for example, causation) that play the role of link.

27 The *locus classicus* for covering law models is Hempel and Oppenheim (1948), but theories according to which explanation involves initial conditions and laws abound; for some examples see Woodward (2017).

- Kim (1994, 68) proposes that explanations track dependence relations that hold between the event that corresponds to the explanandum and another event that corresponds to an explaining fact. In the same vein, Ruben (2004, 210f.) holds that explanations work "only in virtue of underlying determinative or dependency structural relations" that relate the explanandum (or a corresponding event or objects involved therein) with explaining facts (or corresponding events or objects involved therein).
- According to Woodward's (2003, 203) causal-interventionalist theory of explanation, the explanans is constituted by initial conditions and a generalization that relates changes in a variable in the initial conditions to changes in a variable in the explanandum.
- Shortly, we will look at theories of answers to why-questions such as Schnieder's (2010, 2015) account of because-statements, and Skow's (2016) account of 'reason why'-statements, which will provide further support in favor of the distinction between sources and links.[28]

At least two forms of links are discussed in the literature: laws or general principles on the one hand, and instances of explanatory relations such as causation and grounding on the other.[29] I will assume that links may come in either the former, general form or the latter, individual form. While I will not address them, there are some interesting questions here: For instance, does a theory of explanation need both general principles and individual link, or is one enough? If there are both general principles and individual links, how do they relate to each other? Does one explain the other, perhaps?

In contrast to the case of causal explanation, there exists some discussion whether in a case of facts $f_1, \ldots, f_n$ grounding a fact g, the grounding fact that $f_1, \ldots, f_n$ ground g is perhaps always also one of the grounds of g. Nevertheless, however that discussion is settled, the distinction between the explanatory roles of sources and links is clear in the case of grounds and grounding fact too: Some grounds are *not also* grounding facts and thus only sources and not also links.[30]

28 For another take on the tripartite structure of explanation see Glazier (2016).

29 Relation talk is to be understood *cum grano salis* here, allowing for operator views according to which explanatory links are not expressed by sentences comprised of a relational predicate and names, but rather by sentences comprised of a sentential operator and sentences.

30 For a contribution to the discussion mentioned here see Litland (2018). A note on terminology: I call 'grounds' that which does the grounding, 'groundee' or 'grounded' that which is grounded, and 'grounding claim' or 'grounding proposition' a claim or proposition that expresses some propositions or facts grounding another proposition or fact. I use 'grounding fact' to refer to a corresponding fact.

While this section has established the distinction between sources and links, one question that the next two sections address is whether a link of an explanation why *P* normally also is a source of an explanation why *P* (that may or may not be identical to the first explanation).

Some remarks are in order before we can finally take a closer look at answers to why-questions and reasons. First, it may be natural to use talk of explanatory links somewhat differently, namely to refer to the explanatory notions, relations or operators, such as causation and grounding, that occur in what I am calling links. I will avoid this manner of talking. Second, I will sometimes call proposals for explanatory links or corresponding propositions, irrespective of their truth 'explanatory links' as well. Third, note that Schaffer seems to claim that result, base, and link are the only components of an explanation. I only need the assumption that explanations consist at least of these three components, leaving open the possibility of further roles. For example, perhaps the role of background conditions is distinct from those of sources, link, and result.[31] Similarly, if explanation is irreducibly contrastive, contrast classes might have to be added to our picture of explanation, presumably resulting in a picture of explanation comprised of base, a contrast class for the base, link, result, and a contrast class for the result. Presumably, explanatory links should then be redescribed as linking base, result, and the corresponding contrast classes. Finally, it is worth pointing out that the same fact can play the role of link in one explanation and the role of source in another. For example, consider an explanation that has a law of nature, [*L*], as its link. Then assume that some subject *S* knows that *L*. Now, *S*'s knowing that *L* is partially explained by the law of nature [*L*]. But here, [*L*] does not play the role of link as it does in the first explanation; instead in this second explanation it is a ground of the explanandum, viz. *S*'s knowing that *L*, and thus plays the role of a source.

With the distinction between sources and link in place, let us now take a closer look at answers to why-questions and how they relate to what I have said about explanation so far.

1.3 Answers to why-questions

In addition to looking at examples and trying to figure out the different roles that facts can play in explanations, we can find out more about explanation by looking at its connection to why-questions. As we have seen, in one sense, 'explanation'

31 Cf. Skow (2016, 77f.).

denotes answers to why-questions, whereas in other senses, it refers to facts that explain something, or to such facts together with the fact that is being explained. Part of what I will discuss in this section is how these senses of 'explanation' relate to each other and how all this relates to the distinction between sources and links. We start by observing that why-questions can be answered in different ways, out of which I will focus on these main two:

– *P* because *Q*.
– A/the reason why *P* is that *Q*.

These and variants of these appear to be the only ways to answer why-questions: While why-questions can be answered simply by stating the explanandum ('Why is the road slippery?' – 'It rained'), this seems to be elliptic for answers of the two forms above. Also, why-questions may have answers of forms such as 'That *P* is due to . . .' and '*P* in virtue of . . .', but these are plausibly also variants of the two kinds of answer above.[32] Indeed, it *seems* evident that why-*P*-questions have to be answered by providing reason why *P*.[33]

Combining this with the fact that why-questions can be answered using because-claims, we get the intuitively appropriate result that the right-hand clause of a because-sentence expresses a reason for its left-hand clause. Note that this does not entail that the reasons-formulation and the because-formulation are equivalent in every respect; indeed, there may be reasons to believe that in interesting respects they are not equivalent: First, the reasons-variant involves both an element of nominalization and potentially reference to propositions or facts, as well as the concept of a reason, which at least is not obvious for because-claims. Second, the reasons-formulation, moreover, seems to license an inference to the existence of reasons, which the because-formulation does not, again at least not obviously so. But both points are compatible with the assumption that the right-hand clause of a because-sentence expresses a reason for what the left-hand clause expresses.[34]

It is time to deal with some complications surrounding 'because' and talk of reasons: 'because' has an epistemic use in which its right-hand clause expresses an epistemic reason for what the left-hand clause expresses. An epistemic reason for [*P*] is not necessarily a reason why *P* and does not necessarily bring it about that *P*, rather it is a reason *for believing that P*. Reasons why *P* and reasons for

32 Cf. Skow (2016, 24, n. 2).

33 See for example Achinstein (1983, 30), Stanley (2011, 45), and Brogaard (2009, 461). Starting with chapter 2 below, I will argue that we should relax this assumption.

34 Perhaps Skow (2016, 23f.) means nothing more than this when he argues that the two formulations are equivalent.

believing that *P* are distinct, but facts can be both at the same time. This point can be made with a classic example: That the shadow of a flagpole has a certain length can be a (partial) reason for believing that the flagpole has a certain height, but is not a reason (causal or other) why the flagpole has that height. On the other hand, that the flagpole has a certain length is a (partial) reason why the shadow is as long as it is, but it can also be a (partial) reason for believing that it has that length. Since the epistemic use of 'because', epistemic reasons, as well as the corresponding epistemic use of 'why' are not relevant for my purposes here, I will set them aside. Furthermore, I will set aside issues surrounding practical and normative reasons. Reasons why *P* in the sense that I am concerned with are the kind of reasons that, figuratively speaking, *bring it about* or *make it the case* that *P*.

With this clarification out of the way, we can now address our question of how answers to why-questions, the relational sense of 'explain', and the two roles of link and sources are related. According to what I propose to call 'the simplistic theory', answers to why-questions and 'explain' in the relational sense stand in the following relationship:

– If [*P*] explains [*Q*], then *Q* because *P*.
– If [*P*] explains [*Q*], then a reason why *Q* is that *P*.

Recall from the previous section that an explaining fact can play the role of either link or source in the relevant explanation. So, according to the simplistic theory, not only every source, but also every link [*L*] of an explanation why *Q* is a reason why *Q* and occurs in a true because-statement of the form '*Q* because *L*'. For sources, which can, for example, be causes or grounds, this is evident: Causes and grounds for [*P*] *are* reasons why *P*. Whether the same holds for explanatory links is a question that I will turn to now. I will reject the simplistic theory in favor of two accounts that do not conflate the role of explanatory source and explanatory link vis-à-vis answers to why-questions like the simplistic theory does: Schnieder's (2010, 2015) account of because-statements and Skow's (2016) theory of reasons why.

1.3.1 Schnieder's proposal

According to Schnieder's (2010, 10; 2015, 142ff.) proposal, the semantics of because-sentences should be given in terms of what he calls objective productive priority relations that hold between the contents of the clauses of the because-

claim.[35] Objective productive priority relations that fit the bill can, for example, be causal, concern what things consist of, concern the essences of things, or be some mixture of some pure priority relations (these are required to account for because-claims that correspond to mixed explanations, for example explanations that involve both causation and grounding).[36] More precisely, Schnieder's proposal has the following form:

> $\forall S \forall S^*$: ⌜S because S^*⌝ is true iff $\exists R(R$ is a priority relation $\wedge$ R holds between the content of S and the content of $S^*)$.

Moreover, Schnieder (2010, 10) suggests that because-claims are *grounded* in the existence and instantiation of suitable priority relations. This account suggests a picture on which because-claims have a tripartite character: The left-hand clause of a because-sentence expresses an explanandum (in Schaffer's terms the result), and the right-hand clause expresses a source, for example a cause or ground. Instances of Schnieder's objective priority relations correspond to explanatory links. On his picture, because-claims neatly mirror the three roles of sources, link, and result identified in the previous section.

There are several options to reconcile an account like this with explanatory links like laws that are of a different form than instances of priority relations. For example, one might argue that all links are of priority-relation form and that laws and others (if they exist) do not play an immediate role in because-claims, but may well be importantly related to priority relations.[37] Another option would be to revise the account to allow for laws connecting the contents of the two

35 As mentioned above, the *locus classicus* for the thesis that explanation in some sense tracks dependence (or priority) relations is Kim (1994, 66ff.).

36 Like the notion of grounding, the notion of essence will play a pivotal role in what follows. While there are a number of notions of essence – some of which I will say more about and apply later – the most familiar notion is that of an essential property or an individual essence: Sometimes also glossed as the nature of a thing, a thing's essence concerns a subset of its necessary properties – those properties which make it the thing that it is or those properties the thing possesses in virtue of what it is. To give a classic example, it is an essential property of Socrates that he is human (or that if he exists, then he is human), but a merely accidental, i.e. non-essential, property of Socrates that he is a philosopher (after all, he could have taken up another occupation instead). Furthermore, while it is a necessary property of Socrates that he exists in a reality in which 2+2=4 (or that if he exists, then 2+2=4), this is not an essential property, for it does not concern his nature, it does not make Socrates the thing he is, and he does not possess this property in virtue of what h his. We will learn more about the different notions of essence along the way. For some accounts see the *locus classicus* Fine (1994), Fine (1995), and Correia (2006).

37 For example, by partially grounding or unifying them.

clauses of because-statements, but for our purposes we need not make a choice here.

So how does Schnieder's proposal relate to the simplistic theory? As it stands, they need not be inconsistent: Perhaps there are objective productive priority relations such that whenever [*P*] explains [*Q*] by being a link in an explanation of [*Q*], such a relation holds between [*P*] and [*Q*] that underwrites the corresponding because-claim. Nevertheless, the objective priority relations such as causation or grounding that Schnieder actually proposes as grounds for because-statements correspond to the kind of links that have been suggested in the literature and above.

Indeed, it is unclear whether the kind of priority relation required to reconcile the simplistic theory with Schnieder's proposal has ever been proposed: In the case of causal explanation, it plausibly is not causation and, arguably, neither grounding, and it is unclear what else it should be. To unpack this thought, take, for example, the explanation why the window breaks in terms of Moriarty throwing a ball (at it), with its link being the fact that Moriarty's throwing the ball causes the window to break. According to the simplistic theory, the following because-claim is true: 'The window broke because Moriarty's throwing the ball causes the window to break'. But plausibly, causation facts like the fact that Moriarty's throwing the ball causes the window to break are not themselves causes. Nor does this fact seem to ground the breaking of the window – intuitively the breaking of the window just seems to consist in something else (some fact concerning the behavior of the molecules making up the window perhaps) and furthermore, it is plausible that whenever [*P*] grounds [*Q*], [*P*] somehow figures in the essence of [*Q*] or one of its constituents (or something along these lines).[38] In our case this is implausible. So the objective priority relation that underwrites 'The window broke because Moriarty's throwing the ball causes the window to break' is plausibly neither causation nor grounding, and it is unclear what else it should be. We will come back to this discussion in the following section.

1.3.2 Skow's theory

Let us now look at Skow's (2016) theory of 'reason why'-answers to why-questions. Skow restricts his theory to why-questions that are directed at particular events. Let 'Why *P*?' be such a question. Then Skow holds first that it can only be answered

38 See for example Fine (2012), Correia (2013b), and Correia and Skiles (2019). We will return to the connection between essence and grounding in chapter 4.

by citing a reason why *P* and second that only causes or grounds of [*P*] can be reasons why *P*.[39] So an explanatory link like a law of nature in a causal explanation of [*P*] can only serve as an answer to a why-question if it is a reason why [*P*], but since it is neither a cause nor a ground and hence not a reason for [*P*], according to Skow, it cannot serve as an answer to that question.

But then what is the place of explanatory links in Skow's picture? Indeed, while he does not use the terminology of links and sources, a good part of Skow's book is devoted to answering this question and overcoming what he believes to be a confusion of the different 'levels of reasons'. His answer is that explanatory links like laws (as well as background conditions and potentially further elements such as certain explanatorily relevant mathematical facts) are second- or even higher-order reasons, that is, reasons why the relevant first-order reason is a reason why *P*, or even (in the case of third-order reasons) reasons why certain second-order reasons are reasons why the relevant first-order reason is a reason why *P*.[40] As one example for an explanatory episode in which the second-level reason character of a law becomes apparent, Skow (2016, 75) offers the following dialogue:

A: Why did that rock hit the ground at a speed of $4.4\frac{m}{s}$?
B: The reason why it hit the ground at that speed is that it was dropped from a height of one meter.
A: Whoa! I don't understand. Why is it that its being dropped from that particular height is a reason why it hit the ground with that particular speed?
B: Because it is a law that the speed of impact, *s*, is related to the distance fallen *d* by the equation $s = \sqrt{2dg}$ (where *g* is the gravitational acceleration near the surface of the earth); and $\sqrt{2 \cdot 1 \cdot 9.8} \approx 4.4$.

To give a further example, consider an explanation of why a window is broken. Let the (causal) reason be that Moriarty threw a stone at it and let the explanatory link be some suitable law of nature [*L*]. According to Skow, [*L*] is not a reason why the window is broken, rather, it is a second-order reason, a reason why Moriarty's throwing a stone at the window is a reason why the window is broken.

Aside: Skow (2016, ch. 2) indeed goes further and argues that answers to why-questions are what so-called theories of explanation should be interpreted to be about and philosophers of science interested in explanation why should focus on. Skow thinks that if anything, philosophers of science should be interested in explanations in the product sense, if what is meant by this is answers to why-

39 Skow (2016, 29).
40 Skow (2016, secs. 4.2 and 4.3).

questions. His argument here mainly seems to be that only the practice of answering why-questions properly belongs to science and that scientists would remain equally good scientists if they continued to answer why-questions, but stopped explaining why. Suffice to say I am skeptical, one reason being that one goal or aim of science seems to be to create understanding why, but merely creating knowledge of answers of why-questions arguably is not sufficient to create understanding why.[41] To create understanding why, something else is needed, namely explaining why.

Back to reasons and higher-order reasons: I am skeptical whether causes and grounds are the only kinds of reasons and will discuss candidates for reasons that are not causes and perhaps neither grounds in chapters 3 and 4; indeed, even Skow (2016, 109) tentatively suggests that what Yablo (2004) calls 'enablers' and 'enoblers' are further kinds of reasons. But what I take to be the core insight of Skow's account remains: In a given explanation (e.g. a causal explanation), the sources or reasons are what *bring about* the result, in the sense of bringing about that is relevant to reasons why. The link (say, a law of nature) normally does not *bring about* the result, at least not in the sense relevant to being a reason: Links of explanations why P are normally not also reasons why P. For example, consider Moriarty's destroying the window once more: In the relevant sense, only his throwing the ball brings about (together with other causes and background conditions, perhaps) the breaking of the window. The causal link or corresponding law do not have this role: Rather, they can be thought of as what the 'throwing's bringing about the breaking' (at least partially) consists in. In the next section, we will encounter exceptions to the rule: There are some sporadic cases of explanations why Q whose link [L] is also a reason why Q.

Note that there is an interesting connection between Schnieder's account of 'because' and Skow's hierarchy of reasons: Schnieder suggests that because-claims are grounded in instances of priority relations, which I suggested to generalize to explanatory links of all forms.[42] Skow suggests that explanatory links such as laws are second-order reasons. Now consider an explanation why P with [Q] as a reason and [L] as the corresponding link. According to the Schnieder-picture, we have [L] grounds [P because Q]. According to the Skow picture, [L] is a (partial) reason why [Q] is a reason why P, which we can take to mean that [L] (partially) grounds [[Q] is a reason why P]. Thus on each picture, [L] is a reason for the corresponding answer to the question why P.

41 See Hills (2016) for an argument that knowledge why is not sufficient for understanding why. For more discussion, see Sliwa (2015) and Lawler (2016).

42 Schnieder (2010, 10).

1.4 Discussion

While I tend to endorse Schnieder's and Skow's views because they provide plausible and elegant accounts of answers to why-questions, reasons why, and their connection to the roles of the constituents of explanations, there is some intuitive evidence against them (and in favor of something like the simplistic theory) available that needs to be addressed. I take it to be uncontroversial that sources and links can be distinguished in explanations why, but the connections to because-statements and reasons why are somewhat more controversial. The main problem is that there seem to be admissible answers to why-questions such as certain (at least somewhat acceptably sounding) because- and reasons-claims that do not fit well with the Schnieder-Skow picture:

- The window is broken because Moriarty's throwing a ball at it caused it to break.
- *S* is in pain because *S* is in brain state *p* and it is a metaphysical law that if something is in brain state *p*, then it is in pain.
- One reason why the ball fell is that the law of gravitation holds.
- One reason why it is true that snow is white is that for every *P*, [*P*] grounds its being true that *P*.

While not all of these may sound perfectly fine, examples like these do enjoy some intuitive support. In these examples, explanatory links such as [Moriarty's throwing a ball at the window caused it to break] are presented as reasons why the corresponding explananda, e.g. the fact that the window is broken, obtain. But as we have seen, according to Skow, the propositions or facts that are presented as reasons of the explananda here are no such reasons. Rather, they are only second-order reasons. For example, [Moriarty's throwing a ball at the window caused it to break] is a reason why Moriarty's throwing a ball at the window is a reason why the window is broken. As we have seen and will revisit in a bit, Schnieder's account does in principle allow for the because-claims in question, but only if dubious instances of explanatory priority relations are countenanced. Skow's main defensive strategy against cases like these is to maintain that the example sentences are false and do not answer the corresponding why-questions; rather, he suggests, they are ill-formulated attempts at communicating something that constitutes at least a good (partial) *response* to the why-question, but not a proper answer to it:

> The distinction between an answer and a good response applies to why-questions as much as to any other kind. From the fact that providing a body of fact *F* is a good response (in

> context) to the question why *Q*, it does not follow that '*Q* because *F* obtains' is true. It does not follow that '*Q* because *F* obtains' expresses an answer to the question why *Q*. (Skow 2016, 73)

It is possible to strengthen this strategy as follows: Normally, when asking why-questions, we do not (only) ask for an answer, but also to be given an explanation why. Thus, the appropriate response consists in an explanation why. But assuming first that only sources are reasons and only sources are expressed by the right-hand clause of true because-claims, and second that explanations why also involve links that need to be communicated, it becomes understandable why cases like the ones above can appear to be good responses to why-questions, even though they are not: They are attempts at communicating the explanatory link that needs to be communicated in an explanation why.[43]

Having looked at the defensive strategy, let us now turn to the criticisms being raised on the basis of the cases above. There are two: the merely linguistic criticism and the metaphysical criticism. According to the linguistic point, why-*P*-questions can be answered by providing reasons why *P* (be it via because-claims or otherwise), but they can also be answered by (merely or additionally) providing higher-order reasons why *P* or relevant explanatory links. One way to spell this point out is to claim that because-claims do not mirror the tripartite view well and allow for right-hand clauses that express links (or higher-order reasons). According to the metaphysical point, links of explanations why *P* are also always (or alternatively: *normally* or *in the standard cases*) reasons why *P*.

1.4.1 On the merely linguistic point

Criticism of the linguistic kind has recently been brought forward by Insa Lawler (2019). First, she rejects the thesis that only citations of first-level reasons why *P* are answers to why-*P*-questions. Second, she outright accepts the problematic because-claims. Before we look at her supporting argument, recall from the page above that in the literature, it is widely claimed that why-*P*-questions are answered exclusively by citing reasons why *P*. These accounts seem to close the gap that Lawler's proposal tries to occupy: According to them, why-questions only cite reasons why, so assuming, as Lawler wants to allow, that higher-order reasons why *P* normally are not (first-order) reasons why *P*, higher-order reasons why *P* cannot normally answer why-*P*-questions. Presumably, Lawler denies these proposals,

43 Compare the point from understanding why from section 1.3.2. I will further discuss and use this strategy in chapter 3.

and perhaps not without reason, since the literature seems to neglect the relevant evidence concerning because-claims like those offered at the beginning of this section.

Lawler's main defense of the claim that higher-order reasons can answer corresponding why-questions takes the form of a dilemma.[44] On the first horn, she assumes that what counts as a correct answer to why-questions is partially determined by the interests of the investigator. Furthermore, she relies on the assumption that there are why-*P*-questions for which answers that merely express a reason why *P* are unsatisfactory for everyone who does not know certain higher-order reasons why *P*. The case Lawler discusses is somewhat complex, so let us simply grant that there are such cases and note this as a potential point for objection.[45] Lawler takes the assumption to make it plausible that the higher-order reasons should be cited in any complete answer why *P*.

On the second horn of her argument, Lawler discards the assumption of interest-relativity. Taking inspiration from Kim (1994), she suggests that "the subject matter of a why-question is the property of being something the event in question (explanatorily) depends on" (Lawler 2019, 175). She continues to claim that propositions or facts depend in the relevant sense on their second-level reasons and that why-*P*-questions can therefore be answered by citing [*P*]'s second-level reasons.

Let us address the horns of the dilemma in turn. In response to the first horn, it can be argued that knowledge or recognition of certain truths can be necessary for considering answers to questions satisfactory without those truths being part of answers to those questions, and without them following from such answers. Consider:

A: Who made that sound?
B: *a* made that sound.

Even though B's answer is true and complete (let us assume), it is only satisfactory for recipients who recognize that *a* is an agent. Nevertheless, the proposition that *a* is an agent is not part of a full answer to the question.[46] Furthermore, as

44 She offers a further argument using a notion of a complement of an answer, but since that notion is not explained, the argument is hard to assess.

45 It seems we can imagine the student analogue to the bad teacher from above, namely a student who has no interest in getting an explanation why *P* or obtaining understanding why *P* and whose only interest is producing true answers to the question why *P*. It seems such a person will be satisfied by a true answer to the question why *P* that cites only reasons why *P*.

46 Here, it could be objected that it *is* part of a complete answer to a who-φs-question to state that it is an agent that φs; a complete answer to A's question would then have this form: 'The agent *a* made that sound'. This is not implausible, for in the case of answers to why-*P*-questions, a complete answer not only consists in a sentence that expresses a reason why *P*, but in a

pointed out already, there is a source for systematic error here: Very often, when asking why-questions, we are asking for an explanation why. But as we have seen in section 1.1, explaining why and telling why have different success conditions. So when thinking about whether certain answers to why-questions are satisfactory, we may confuse what constitutes a good answer with what constitutes a good explanation.

In any case, the second horn can be resisted because it is questionable for the following reasons: First, recall that Lawler wants to allow that second-order reasons are normally not first-order reasons; so the dubious result would follow that something can explanatorily depend on something that is not a (first-order) reason for it. Second, it is unclear what kind of dependence could fit the bill: While both causal and metaphysical dependence have been studied extensively, as I have suggested above, they normally do not seem to hold between link and result of an explanation. More importantly, [*P*] causally or metaphysically depending on [*Q*] in the relevant sense seems to be sufficient for [*Q*] to be a (first-order) reason why *P*, but this is exactly what Lawler wants to avoid. Allowing for the problematic because-sentences to be true (instead of only being a slightly confused means of communicating something true) does not seem worth incurring these problems.

Finally, here are two tentative further reasons to accept the linguistic part of the account developed in the previous section: First, we already have the more lenient concept of explaining. Second, theses like reference magnetism suggest that meanings are partially determined by how well they fit objectively important distinctions. The difference between sources and links, or reasons and higher-order reasons, seems to be objectively important. A 'because' that only connects sources or first-order reasons with an explanandum seems to fit this distinction better than the alternative. In the end though, I am more interested in explanation, reasons, and why things are some way or other, than in linguistics. While I favor the Schnieder-Skow picture, we should concede that there are intuitions concerning because- and reasons-claims that do not fit the picture. Luckily, it often seems easier to assess whether a fact involved in an explanation plays the role of source or link.

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sentence that also states that the reason is a reason why *P*: 'A/the reason why *P* is that *Q*' (or a sentence that accomplishes something similar by using 'because'). Be that as it may, I am confident that the following considerations are sufficient to resist Lawler's proposal.

1.4.2 On the metaphysical point

Let us address the metaphysical point now: Are links of explanations why *P* perhaps also *always* reasons why *P*? Note first that it is plausible that links of explanations why *P sometimes* also are reasons why *P*:

- Assume that God exists and is omniscient and let it be true that *P*, then [*P*] is a (partial) reason why God is omniscient. Let [*L*] be the explanatory link holding between [*P*] and God's being omniscient, then [*L*] is also a (partial) reason why God is omniscient.
- For an atheistic example, observe that true disjuncts are reasons of their disjunction. But then consider $[P \vee L]$, where [*P*] obtains and [*L*] is the (law-like) explanatory link between $[P \vee L]$ and [*P*].[47]
- Consider why $\exists p(p)$. According to the idea that existential quantifications are grounded by their true instances, we get that $[\exists p(p)]$ is grounded in $[2+2=4]$. Hence, the latter is a reason why $\exists p(p)$. But $[[\exists p(p)]$ is grounded in $[2+2=4]]$ also provides a true instance of $[\exists p(p)]$, therefore is a ground and reason for it.[48]
- Rosen (2017) argues for cases in which, roughly, a normative fact [*Q*] is (metaphysically) grounded in a non-normative fact [*P*] together with a normative law that connects [*P*] and [*Q*], and which we can write as '$[\Box_{norm}(P \rightarrow Q)]$'. According to Rosen, considerations concerning the nature of normative facts motivate that sometimes the two elements of a (normative) covering law explanation involving initial condition (e.g. [*P*]) and normative law (e.g. $[\Box_{norm}(P \rightarrow Q)]$) together ground the explanandum (e.g. [*Q*]) of said covering law explanation. We will come back to Rosen's argument in chapter 3, where I discuss a phenomenon called 'explanation by status', of which explanation by law-status is one kind. For now, note that Rosen's argument does not amount to the thesis that *in general* or *by default*, links of explanations why *P* are also reasons why *P*.

Now I want to discuss whether we should accept the stronger thesis that links of explanations why *P* are *always* (or at least *normally*) also reasons why *P*. Note first that we can use the cases above as an intuitive contrast class in which a link of an explanation why *P* is also a reason why *P*. While the cases are plausible, intuitively, not every explanation (not even every grounding explanation) is like these (somewhat recherché) cases in the relevant respect. Let us further look at some criticisms of Skow's proposal aimed at the distinction between levels of

47 Compare also Litland (2018).

48 For a critical discussion of the pertinent grounding rule see Krämer (2013).

reasons why and the thesis that links in an explanation why *P* normally are not also reasons why *P*.[49] We start with Pincock (2017), who writes:

> [There] is a substantial and interesting disagreement on reasons why for events. Skow maintains that all reasons why an event occurs are either causes or grounds, and this somehow flows from the natures of causes, grounds, and events. Woodward [in his (2003)] insists that causes are not metaphysically autonomous in this sense: for *C* to be a cause of *E*, some other fact must obtain beyond the occurrence of *C*. Furthermore, it is this other fact that is an essential ingredient in a reason why *E* occurs. [. . .] If what it is for *C* to be a cause of *E* includes not only the occurrence of *C*, but also some general regularity, then it is perfectly appropriate to make that general regularity part of one of the reasons why *E*.

I will ignore the question whether Pincock's reading of Woodward is correct here. While I agree that it is a substantial question whether higher-order reasons always also are first-order reasons, Pincock's point remains doubtful to me. Let us assume that it is indeed correct that what it is for *C* to be a cause of *E* includes some general regularity and that that regularity must obtain for *C* to be a reason for *E*. Skow can simply accept this and, plausibly, hold that this just means that the general regularity is an (essential) reason why *C* causes *E*, or why *C* is a (causal) reason for *E*. To support the point, note that not everything that is part of what it is for *C* to be a cause of *E* also plausibly is a reason why *E*: For example, presumably part of what it is for *C* to be a cause of *E* is for *C* to be an event. But it is not particularly plausible that *C* being an event is a reason why *E*.

Pincock's second criticism concerns the compatibility of Skow's proposal with contrastivism; he presents Skow's proposal to deal with contrastivism and finds it lacking:

> 'If contrastivism about causation turns out to be correct, then I will advocate contrastivism about reasons why as well' [Skow 2016, 36]. With this shift, Skow's proposal would be that when *C* rather than C' is a reason why *E* rather than E', then *C* rather than C' is a cause (or a ground) of *E* rather than E'. Woodward's position would mandate that the fact that *C* rather than C' is not itself a reason in isolation. Instead, only the fact that involved some regularity along with the contrastive fact would count as a reason why. (Pincock 2017)

Here, Pincock seems confused. According to non-contrastivism concerning the 'reason why'-relation, it is a two-place relation: '. . . is a reason why . . .'. Skow (2016, 36, n. 24) suggests that the corresponding relation according to contrastivism should be a four-place relation: '. . . rather than . . . is a reason why . . . rather than . . .'. Note that nothing here requires that there is a fact 'that *C* rather

49 I will ignore Baumgartner (2017) who also criticizes Skow's account, for I have found no real argument there.

than *C*′' which is somehow itself a reason (or cause or ground) in isolation. Indeed, nothing in Skow's formulation requires that according to contrastivism, the 'reason why'-relation is a two-place relation relating facts of the form '*P* rather than *P*′'. Furthermore, the contrastivity implicit in Woodward's regularities neatly maps onto the contrastive 'reason why'-relation or contrastive because-claims; indeed, it may seem to underlie them. Pincock and his Woodward are thus confronted with two awkward questions that Skow avoids: First, why demand that the regularity is also a reason why *E* obtains? Second, what further kind of regularity underlies the reasons-why facts that involve regularities?

Lange's (2018, 36) criticism of Skow's point begins as follows:

> [Skow] does not examine any explanations of laws or even of regularities. Skow would presumably have to regard laws in those explanations as first-level rather than only second-level reasons.

Skow can and should simply accept this. Unfortunately, at points, he mistakenly asserts that only facts that correspond to events can be first-order reasons for facts corresponding to events. This does not follow from his thesis that only grounds and causes are first-order reasons for event-corresponding facts, as can be shown by the following example that is inconsistent with the first, but consistent with the second thesis: Consider the event of an agent *S* coming to know that *L*, where [*L*] law of nature. Then, one (partial) reason why *S* comes to know that *L* is that *L*. Here, the law of nature [*L*] is a (partial) ground and hence a (partial) reason for *S*'s coming to know that *L*. The point is an instance of the above observation that the same fact can play the role of source in one explanation and the role of link in another. Lange (2018, 36) continues:

> I am reminded of the inference-ticket conception of natural laws – as Skow (2016, 85–87) apparently was, too – according to which laws do not explain, but merely mediate the inference from the explanans to the explanandum. Nothing in scientific practice makes that conception plausible.

Nothing that Lange says in the cited passage seems to address Skow's theory: We, and Skow, can assume that explanatory links (such as laws) do explain, but that they do so by being an explanatory link (or, following Skow, a second-order reason why) rather than a reason why the explanandum obtains. Finally, Lange (2018, 36) writes:

> Critics of the inference-ticket conception objected that in an inference, one inference rule can be replaced by an additional premise, with another inference rule stepping in to mediate the new inference (Nagel 1954). Likewise, it seems to me a matter of context and convenience whether, in offering or reconstructing a given explanation, we portray the fact that

> three fails to divide 23 as [a reason] why the fact about the numbers of strawberries and children [is a reason] why Mother failed or whether we portray both facts as [reasons for] Mother's failure.[50]

Opposing Pincock, Lange here assumes that the question whether links of explanations why *P* are also always reasons why *P* is insubstantial. Pro Pincock and contra Lange, we will see in the following chapters that whether second-order reasons are also first-order reasons can have substantial consequences: As the next chapter shows, answering the question negatively opens up the possibility that chains of reasons why can terminate without leaving any reason within the chain unexplained. Furthermore, the relation between reasons and what they are reasons of is widely assumed to have certain structural features such as transitivity, asymmetry, and irreflexivity.[51] If links of explanations why *P* are not automatically reasons why *P*, then there is some room – to be further investigated in chapter 6 – for the assumption that the relation between links and results does not have the same structural features as the relation of reasonhood.[52]

Some appeal of the thesis that links of explanations why *P* are always also reasons why *P* may come from overstretching a certain metaphorical view of explanation. According to the metaphor in question we can think of explanatory links as explanatory machines that take sources as input and deliver results as outputs.[53] Now, in a causal explanation, the sources are the causes, and real situations involving machines with inputs and outputs, facts about the machine are part of the causes of facts about the outputs of the machine. But to take this to suggest that links are always also reasons would take the metaphor too far. We have already assumed that links of causal explanations are not themselves causes

50 Here, Lange discusses a case of mathematical explanation concerning which Skow (2016, ch. 5) claims that the fact that three fails to divide 23 is a second-order reason rather than a first-order reason. It seems that if what Lange says is true, it applies equally to the question whether explanatory links of an explanation why P are also always reasons why P.

51 For the case of grounding see for example the contributions in Correia and Schnieder (2012).

52 A similar move can be suggested concerning the discussion of the grounds of grounding: A number of authors assume that grounding is well-founded (for an explanation of notions of well-foundedness see Rabin and Rabern 2016). If grounding claims of form 'Γ $< P$' would always be grounds of what their groundee-clause expresses, then the thesis that every grounding claim is grounded would threaten to violate the well-foundedness of grounding in at least one important sense: Suppose f is a grounding fact. Then by the assumptions and given that grounding-circles are forbidden, f is at least partially grounded in another grounding fact g and a regress of grounding facts is started. As Bennett (2011) argues, well-foundedness can be secured by demanding that all the grounding facts of the regress are grounded in a non-grounding fact h. But if we deny that grounding claims of form 'Γ $< P$' are always grounds of what their groundee-clause expresses, the regress does not even get off the ground. For more on this topic see Litland (2017).

53 We will revisit the metaphor in the next chapter.

of the relevant explanandum – but it is exactly this that taking the metaphor too far seems to suggest. Even if we allow for metaphors to provide evidence like this, in this case, without taking it too far, the metaphor of the machine does not support links being reasons of the relevant explanandum.

In the absence of more decisive arguments, my suggestion is to let theoretical fruit- and usefulness decide whether links of explanations why *P* are also reasons why *P*. Alas, there seems to be little theoretical motivation for considering links of explanations why *P* per default to be reasons why *P* besides wanting to capture the intuitions, which proponents of the hierarchy of reasons can account for differently – at least, I have found no motivation in the literature. As we have seen in the previous section, the assumption that links of explanations why *P* are also (normally) reasons why *P* plausibly requires explanatory links featuring other explanatory relations than causation and grounding, making the resulting theories less parsimonious and more complicated, without apparent advantage. For instance, contrary to what Pincock may say, Woodward's theory of causation does not involve such further explanatory links. Evidently, it can do without them.

In response to this point, it might be suggested that links of explanations why *P* can be reasons why *P* that need not be linked to [*P*] by explanatory links themselves. But this would be to give up on the attractive theory of explanation, reasons, and links presented above – in particular, this would mean giving up on the Schnieder-Skow picture according to which reasonhood consists in the existence of – or can be grounded in – corresponding explanatory links. Of course, there may well be a concept of a reason why *P* that is essentially my concept of a proposition or fact that explains [*P*], either in the capacity of an explanatory source/reason why in my sense or as an explanatory link; such a concept would have none of the metaphysical ramifications just discussed. But it is important to note that the corresponding notion of a reason will not necessarily inherit the properties of the original notion of a reason why: For example, the corresponding relations of reasonhood may have different structural properties.[54]

Another respect in which the resulting theories are more complicated without apparent advantage is that the assumption that links why *P* are also by default reasons why *P* seems to generate an infinity of reasons why *P*: Assuming that a given link [*L*] is also a reason why *P*, there needs to be a link [*L*′] connecting [*L*] and [*P*]. But arguably, these links are not identical (otherwise, people would be widely mistaken about the explanatory links that are proposed). Then, since [*L*′] is also a reason why, there needs to be yet another link connecting it and [*P*], and thus a

54 Again, see chapter 6.

plenitude of reasons without apparent theoretical advantage is generated.[55] This argument is related to an argument by Bolzano to the effect that complete grounds need not contain corresponding grounding facts, on pain of generating infinite and unnecessarily complex full grounds.[56] In our case, the problem may seem less pressing, because the infinity of links are not necessarily required for a *full* ground of [*P*], but note that reliance on the intuitive motivation that the links are somehow *required* as reasons to explanatorily account for [*P*] makes it hard to argue this difference.

For now, let us take stock: For me, the attractiveness of the Schnieder-Skow picture consists first in the fact that according to it, the behavior of answers to why-questions, reasons-claims, and because-claims mirrors the intuitively and theoretically different roles that links and sources have in explanations. Together, these theses form a neat and coherent package that I am inclined to subscribe to. But we should keep in mind that if this is right about answers to why-questions, we have seen that our intuitions about what is a true answer to such a question can be quite misleading – confusion between what facts are reasons why *P* and what facts constitute (part of) a good response to a why-*P*-questions in a different capacity such as being a link is widespread. Another point that we will come back to is that if we have intuitions concerning what explains what, whether or not these are (correct or incorrect) intuitions concerning because-claims and reasons-claims, these intuitions may be cashed out in a number of different ways. Second, the Schnieder-Skow picture is attractive to me because, as mentioned above, distinguishing the reason-explanandum relation from the link-explanandum relation opens up a number of theoretical options. In the following, I will make apparent where I rely on which assumptions introduced in this chapter. Two notable instances concern the discussion of explanation by status in chapter 3 and the discussion of self-explanation in chapter 6, where I suggest that separating the formal features of 'explain' in the relational sense and 'because' may lead to fruitful theorizing.

55 Perhaps it might be suggested that the regress can be avoided if the true form of explanatory links is something like '$Q, L \Rightarrow P$', where [*Q*] is a reason why *P* and [*L*] is the link itself. But, to my knowledge, according to no theory of explanation available in the literature do explanatory links have this form.

56 See Bolzano (1837, §199, 344f.).

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 ∅' 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.

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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 $\text{iff}_{\text{def.}}$ 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?

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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 '$\Gamma < \phi$', and non-factive grounding facts are expressed by sentences of the form '$\Gamma \Rightarrow \phi$', where 'ϕ' expresses the groundee and 'Γ' 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 '$\Gamma < \phi$', in the case of zero-grounding statements, the 'Γ'

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 '$\Lambda\varnothing$' 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*) $\Lambda\varnothing$.

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 $T_\Box$! Hence, the empty plurality of propositions weakly grounds $T_\Box$, but it also strictly grounds it, because $T_\Box$ 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: $\blacksquare(P \rightarrow Q)$
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: $\blacksquare Q$
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 '$\blacksquare(\ldots \rightarrow \ldots)$', 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, 'Γ' 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 '$\blacksquare(\Gamma \rightarrow P)$' (with '$\Gamma$' 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.

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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 '⇒-Introduction' (Litland 2017, 297) for non-factive ground (expressed by '⇒').[76] According to this rule, whenever there is an explanatory (grounding) argument from premises $\phi_0, \phi_1, \ldots$ to conclusion ϕ, there is an explanatory (grounding) argument from these premises to the non-factive grounding claim $\phi_0, \phi_1, \ldots \Rightarrow \phi$, 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 $\phi_0, \phi_1, \ldots$, infer from this ϕ with an explanatory (grounding) argument and then infer $\phi_0, \phi_1, \ldots \Rightarrow \phi$ 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 $\Rightarrow (\phi_0, \phi_1, \ldots \Rightarrow \phi)$.

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 ⇒-Introduction.[77] For our current purpose, note though that even if ⇒-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 ⇒-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 ⇒-Introduction may not be intended as an independent argument based on the independent merit of -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 is 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 '$\varnothing$' to stand for the empty set of reasons why (the empty explanatory base), which gives us '. . . because $\varnothing$' 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, Schupbach 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 Schupbach 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 $f_0, f_1, f_2, \ldots$, 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]

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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 '→' 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 $\ulcorner \beta \urcorner$ 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 '→' 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 '→' is false.

Let us consider the syntactic clause first:

> If L is a finite list of formulas $\ulcorner\alpha\urcorner, \ulcorner\beta\urcorner, \ldots$, and $\ulcorner\omega\urcorner$ is a formula, then $\ulcorner\alpha, \beta, \ldots \rightarrow \omega\urcorner$ 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 '→' 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 $\ulcorner \ldots \rightarrow \omega\urcorner$ (where $\ulcorner \ldots \urcorner$ are the formulas in L) is true iff $\ulcorner\omega\urcorner$ is true, or there is at least one formula in $\ulcorner \ldots \urcorner$ 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 '→' 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):

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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.

3 Explanation by Status

This chapter explores the practice of *explanation by status*, in which a truth with a certain status (i.e. necessary status, essential status, or status as a law) is supposed to be explained by its having that status.[110] In this chapter, I investigate whether such explanations are possible. Having found existing accounts of the practice wanting, I then argue for a novel account of explanation by status as *empty-base explanation*. As mentioned in the introductory chapter, we continue here our exploration of ways in which explanations could be considered especially strong or ultimate qualities which are often associated with explanations by status by their proponents.

The notion of empty-base explanation captures a certain limiting case of ordinary explanation so that, according to the empty-base account, explanation by status can be fruitfully understood as a corresponding limiting case of ordinary explanation. One way in which the empty-base account is argued to be superior to other treatments of explanation by status is that it allows for a principled assessment of the possibility of particular kinds of explanation by status. Thus, one result of the present discussion is that explanation by essential status and status as a law are possible, while explanation by merely necessary status is not.

In what I call 'explanation by status', a truth that has a certain status, e.g. modal status, is supposed to be explained by its having that status (hence the name). Here is a schematic list of the kinds of explanation by status that this chapter primarily deals with:

(Explanation by Necessity)	That it is necessarily true that *P* explains why *P*.
(Explanation by Law)	That it is a (descriptive) law that *P* explains why *P*.
(Explanation by Essence)	That it is an essential truth that *P* explains why *P*.[111]

The status notions, e.g. the notions of modality and law, can be varied to obtain related kinds of explanation by status. For explanation by metaphysical necessity see e.g. Leibniz (1714), van Inwagen (1996) and Rundle (2004) who apply the idea in philosophical theology and to the question of why there is anything at all. Block and Stalnaker (1999) and Hill and McLaughlin (1999) use it in their abductive arguments against dualism in the philosophy of mind. Biggs (2011) builds an abductive epistemology of modality upon it, and Glazier (2017a) uses it in his account of the difference between epistemic and metaphysical necessity. For explanation by natural necessity

110 We already briefly encountered explanation by status in the previous chapter.

111 I use 'it is an essential truth that . . .' as a placeholder for various essential idioms such as 'it is part of the essence of . . . that . . .'.

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see Lange (2009a, 2013a). For explanation by metaphysical law and law of nature see Kment (2014, ch. 6) and Lange (2009b). For explanation by essence see Rosen (2010), Kment (2014, ch. 6), and Glazier (2017b).

Besides proposals concerning explanation by necessity, law, and essence, some further proposals that fall into the broader category of explanation by status have been advanced in the literature. Van Inwagen (1996) and Hicks and Wilson (2021) for example discuss explanation by high objective probability, while Leslie (2001) and Rescher (2016) defend explanation by value status. In what follows I am primarily concerned with explanation by necessary status, essential status, and law (as characterized by the schemata), but see section 3.6 for a discussion of explanation by high probability.

This is the plan for the chapter: Section 3.1 uses the framework developed in the previous chapters to structure the present investigation around some initial questions. Section 3.2 discusses reasons against the existence of explanation by *necessary* status, while section 3.3 discusses reasons in favor. Section 3.4 investigates to what extent the preceding considerations generalize to the cases of explanation by *essential* and *law* status and then considers two reactions to the discussion: According to Kappes and Schnieder (2016), explanations by status are not possible, but pointing out the status of a proposition can play a role related to explanation. According to Glazier (2017a, 2017b), explanations by status require *sui generis* explanatory relations to hold between the explanandum and the corresponding status ascribing proposition.[112]

Having found these reactions wanting, section 3.5 uses the notion of an *empty-base explanation* and shows how explanation by status can be fruitfully understood as empty-base explanation. I argue that my proposal deals well with the considerations of the previous sections and compares favorably to Glazier's rival proposal. But while it makes sense of explanation by status in general, it also provides an argument against the possibility of explanation by necessary status in particular. As a remedy, I suggest that proposals involving explanations by modal status are best substituted by explanations by status involving notions like essence or lawhood. Applying the empty-base account further, section 3.6 shows i) how it may be used to assess van Inwagen's (1996) idea of explanation by high objective probability, and (ii) how it can shed some light on the relation between universal generalizations and corresponding explanatory laws. Finally, the appendix adds some further tangential discussion.[113]

112 Two alternative approaches to explanation by status may be provided by Bertrand's (2019a, 2019b) account of metaphysical explanation by constraint and Kovacs' (2020) unificationist theory of metaphysical explanation that I suspect can be fruitfully applied to understand explanation by status from a unificationist angle.

113 This chapter has grown out of joint work with Benjamin Schnieder in Kappes and Schnieder (2016), as well as Kappes (2020a).

3.1 Introductory considerations

Using the tripartite account of explanation and its relation to 'because' sentences and 'why' questions from chapter 1, we can formulate the following initial questions concerning explanation by status:

1. What, if any, is the explanatory role of the status proposition: Is it a reason why the explanandum obtains or an explanatory link?
2. What kind of links occur in explanations by status, and which explanatory notions occur in them?
3. What is the intended scope of the three schemata given above?

With respect to the first question, it may seem that in explanations by status, the status proposition has the role of reason why the explanandum obtains – after all, the status proposition does not appear to *link* anything to the explanandum. Moreover, when stating such explanations by status, philosophers often assert an instance of '*P* because $^{*}P$', where '*' stands for an operator that expresses the status in question.[114] We therefore assume for now that these explanatory proposals advance reasons for (or sources of explanations of) the relevant propositions or facts.

In section 3.5 I will revisit this assumption and propose that we should construe proposals for explanations by status as proposals for empty-base explanations, whose explanatory link is a status proposition. For now, given the assumption that explanations by status advance reasons why their explananda obtain, and given what chapter 1 has established about the relation between reasons why and 'because'-claims, we can derive the following schemata from the three schemata above:

(Because Necessity) *P* because it is necessarily true that *P*.
(Because Law) *P* because it is a (descriptive) law that *P*.
(Because Essence) *P* because it is an essential truth that *P*.

With respect to the second question, we assume for now that the explanations by status under discussion are supposed to be grounding explanations, which is plausible, given that they seem to be metaphysical explanations. When the arguments for and against explanation by status are on the table, I will consider which of them remain once we lift the assumption that the explanatory relation is grounding, as Glazier (2017a, 2017b) advocates.

114 For instance, Glazier (2017, 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*'".

With respect to the third question, the candidate answers are that the scope is either restricted only to propositions which possess the status in question (i.e. restricted only to propositions which are indeed necessary, essential or possess law status) or it is restricted to a subclass of these propositions. The first restriction is mandated by the factivity of 'because' and explanation: Only true propositions can be explained and only propositions that possess the relevant status could in principle be explained by their having that status. On the other hand, note that a further restriction of the schemata's scope would constitute a significant intuitive and theoretical burden: Lest the restriction appear arbitrary, it has to be principled somehow, but it is hard to see what such a principle could look like.

Moreover, full grounding explanations plausibly satisfy something like deRosset's (2013a) "Determination Constraint". The idea behind this constraint is approximately this: If *a*'s being *G* is fully grounded in *a*'s being *F*, there should be no entity that is *F* but whose being *F* does not ground its being *G* – if there were such an entity, the explanation of *a*'s being *G* in terms of *a*'s being *F* would seem incomplete. Something analogous appears to hold for explanation by status: If [*P*] is fully explained by its being necessary, then there should be no necessary proposition [*Q*] which is not explained in its being necessary – if there were such a proposition, the explanation of the first proposition in terms of its being necessary would seem to be incomplete.[115]

There is thus considerable pressure to accept that if a proposition's necessary, essential or law status explains its truth in one case, it should do so in general, and I will assume as much in the [116] following.

3.2 Against explanation by modal status

Under the assumption that the available kind of explanation is grounding explanation, this section offers a number of considerations to motivate that for no [*P*], [*P*] explains [*P*] in the sense of figuring in the base of an explanation of [*P*]. In the idiom of reasons, it offers considerations to the effect that for no [*P*], [□*P*] is a reason why [*P*].[117] Correspondingly, I will argue against (all but possibly a few exceptions of) the instances of the following schema (for now, 'because' expresses grounding):

115 As always, '[. . .]' is used to refer to the proposition expressed by the sentence within.

116 Below we will encounter reason to believe that the determination constraint argument must be revised, although in a way that does not affect the following arguments. See appendix A of this chapter for further development of the determination constraint argument.

117 A possible exception stems from cases that we will encounter in the next section.

(BECAUSE-□) *P* because □*P*.[118]

Intuitive doubts: The first reason to doubt the instances of BECAUSE-□ comes from intuition: At least in a certain light, it is hard to see what explanatory value it should have to point out the necessary status of a proposition. Correspondingly, the instances of BECAUSE-□ do not seem particularly plausible. More specifically, it is hard to see how the truth of a proposition should be brought about (and hence be explained) by its necessary truth. Of course, the latter *entails* the former, but whether the latter *explains* the former is nevertheless intuitively doubtful.[119]

Perhaps this intuitive worry can be sharpened by considering what the propositions [*P*] and [□*P*] are about. If '□*P*' can be paraphrased as 'It is necessarily true that *P*', the corresponding proposition primarily appears to be about a certain other proposition, namely the proposition [*P*] and the way in which this proposition is true, namely necessarily. But [*P*] on the other hand normally concerns something else: For example, [□(2 is prime)] primarily appears to be about the proposition [2 is prime] and this proposition's being necessarily true. On the other hand, [2 is prime] primarily appears to be about the number 2 and its being prime, and not at all about the proposition [2 is prime] or that proposition's being necessarily true. What lies behind the intuition above may then be that the way in which the proposition [2 is prime] is true is not explanatorily relevant to 2's being prime; more generally, what [□*P*] is primarily about can seem not to be explanatorily relevant to [*P*].

Consider also these two plausible schemata concerning the grounds of propositions expressed by claims of the form 'It is true that . . .' and 'It is a fact that . . . ': (i) 'It is true that *P* because *P*' and (ii) 'It is a fact that *P* because *P*'.[120] The idea here is that how things are at least partially grounds the truth of propositions about how things are and it being a fact that they are as they are. To an extent, this seems to generalize: What goes on with propositions and facts is often at least partially grounded in whatever those propositions and facts concern. Now if '□*P*' can be paraphrased as 'it is necessarily true that *P*' or 'it is a necessary fact that *P*', we may get a reason for our uneasiness about the instances of '*P* because □*P*', for these would then seem to require grounding how things are in what goes on with the corresponding propositions or facts, rather than the other way around. These are many 'if's, so let me provide some more arguments.

Grounding elimination rules: Construed as grounding explanations, some paradigmatic cases of explanations by status conflict with Fine's (2012, 63f.) influential

118 The only instances that will interest us are those where [□P] is true, the others are false anyways because 'because' is factive.

119 Cf. Kappes and Schnieder (2016, 556).

120 These principles are widely endorsed, cf. Künne (2003) and Dixon (2018).

logic of ground, according to which any proposition that grounds $[P \vee \neg P]$ must either be identical to its true disjunct or ground it.[121] The logic of (Fine 2012) captures this idea by postulating elimination rules for the impure logic of ground, for instance the rule $\vee E$, but the idea is also contained in Fine's (2017b) account of grounding in terms of truthmaking.

If there are true instances of BECAUSE-□, '$P \vee \neg P$ because $\Box(P \vee \neg P)$' should surely be among them, but since $[\Box(P \vee \neg P)]$ is not in general either a true disjunct of $[P \vee \neg P]$ or grounds such a disjunct, these candidates for explanations by status are ruled out by the logic of ground. Since it is hard to see how necessary status could only sometimes explain, we obtain a general argument against explanation by modal status understood as grounding explanation.

Glazier (2017b) reacts to this problem by postulating further (non-grounding involving) types of explanatory links specific to explanations by status, I discuss this proposal below. Another option is to question Fine's rules, which do not obviously enjoy more than *some* support from intuitions that a number of authors do not share, see for example Rosen (2010, 2017) and Yablo (2014, ch. 4). We will come back to this topic in chapter 4 where we will discuss the explanation of logical theorems. For now, let us discuss some more reasons against the instances of BECAUSE-□.

Regress: Above I have argued that if '*P* because □*P*' is true for some necessarily true '*P*', it should be true for all necessarily true '*P*'. Now, since necessity can be iterated, regresses like the following arise:

– 2 is prime because □2 is prime.
– □2 is prime because □□2 is prime.
– . . . etc.

Whether explanatory structures like this have any explanatory value is questionable, and the idea that the truth that 2 is prime is *brought about* by a series of more and more complex modal truths appears doubtful.[122] Moreover, while opinion on the matter is divided, a number of philosophers believe that there cannot be infinitely descending grounding chains, at least not without every element in the chain also being grounded in something ungrounded.[123] But the idea that the elements of the regress are also grounded in something outside it does not help here: On pain of restarting the regress, these grounds must be contingent, which in itself is already dubious, but particularly problematic in the present context: Explanation by

121 Or "play the same grounding roles", cf. Glazier (2017b, 2876).
122 Cf. Kappes and Schnieder (2016, 556f.). See section 3.3 below for a more positive view of the regress.
123 Cf. Rabin and Rabern (2016).

modal status is often offered as a kind of particularly good, modally stable and ultimate explanation that contingent explanation cannot provide.[124]

Furthermore, it seems intuitively plausible that if it is true that $\Box P$, then it is also true that $\Box\Box P$ because $\Box P$; this is also supported by the plausible idea that (with possible exceptions), grounding explanations should proceed from less complex to more complex propositions. But this makes matters worse, because if it is true that $\Box P$, then we get '$\Box P$ because $\Box\Box P$' from BECAUSE-$\Box$ and '$\Box\Box P$ because $\Box P$' from the assumption; together, the two claims violate the asymmetry of grounding. I will discuss the potential for asymmetry violation further in section 3.4 where we drop the assumption that explanation by modal status is a kind of grounding explanation.

To avoid these problems, BECAUSE-$\Box$ could be restricted and single-box propositions assumed to ground their non-boxed constituent propositions, as well as the corresponding multi-box propositions. Here, I want to commit to the argument from section 3.1 and submit that the restriction of BECAUSE-$\Box$ is not feasible. Also, such a proposal could not claim the potential advantages of the regress discussed in section 3.3.[125]

Problems for certain reductive theories of modality: According to some theories, all metaphysical necessities can be grounded in propositions that do not involve modal operators. For example, according to a proposal attributable to Fine (1994), all metaphysical necessities can be grounded in truths about essences. Consider a metaphysical necessity [$\Box P$] and its ground [Q], e.g. an essential truth. Now, essential truths are themselves necessary.[126] But then [$\Box Q$] is true as well and presumably grounds [Q]. Since we assumed a theory according to which all metaphysical necessities can be grounded in other truths, we embark on a regress that once more only seems stoppable in an ad hoc fashion.

This time, not only the explanatory extravagance of the regress is problematic, but the fact that it is in conflict with the reductive goal of the kind of theory we assumed: This kind of theory is supposed to show that every metaphysical necessity can ultimately be reduced to or grounded in truths that do not involve metaphysical necessity. But if the regress obtains, this cannot be true: Every

124 See section 3.3.

125 A referee for the paper that this chapter is based on has suggested to me that the regress could perhaps be stopped by identifying the propositions expressed by sentences of form '$\Box P$' and $\Box\Box P$'. Maybe, but not without restricting BECAUSE-$\Box$: The regress arises from the schema by substitution of 'P' even if we assume that '$\Box$2 is prime' and '$\Box\Box$2 is prime' express the same proposition.

126 More generally, one might try to argue that the grounds of metaphysical necessities must themselves be necessary. Note that I call only truths of form '$\Box P$' 'necessities' and *not* all necessary truths.

essential truth will be further grounded in its being a necessary truth. Moreover, given that while every metaphysical necessity is grounded in an essential truth, every essential truth is also grounded in a metaphysical necessity, it seems that no asymmetry can be salvaged that would allow us to claim that metaphysical modality is reduced to essence and not vice versa.

The next problem for grounding explanation by necessary status stems from the paraphrase of necessity as truth in all possible worlds. Given the paraphrase, grounding a proposition in a proposition that expresses its necessary status looks like using a universal quantification ('In all possible worlds: *P*') to ground one of its instances ('In this possible world: *P*'). However, universal quantifications are grounded in all of their instances taken together.[127] More perspicuously, the following assumptions lead into an explanatory circle:

(Grounding by Necessity)	*P* because □*P*.
(Grounding by P.W.)	□*P* because in all possible worlds: *P*.[128]
(Grounding by Instances)	(In all p.w.: *P*) partially because in this possible world: *P*.
(@*P* by *P*)	(In this p.w.: *P*) because *P*.

One of these needs to go, and since (Grounding by P.W.) is true by assumption and (Grounding by instances) is supported by the literature, the culprit is either (Grounding by Necessity) or (@*P* by *P*). I submit that (@*P* by *P*) seems at least as plausible as (Grounding by Necessity).[129]

Next, given certain anti-realist theories of modality, instances of '*P* because □*P*' deliver highly implausible explanatory dependencies. For example, one might think that modal anti-realism entails that true statements of the form '□*P*' are at least partially grounded in mental facts. But if [*P*] is grounded in [□*P*], then by transitivity of grounding, [*P*] is at least partially grounded by certain mental facts. In terms of 'because' this means that for [*P*] that satisfy '*P* because □*P*', modal anti-realism and transitivity of 'because' entail that *P* because of certain mental facts, for instance that ∀*x* is scarlet→ *x* is red because of certain mental facts. Thus on the proposed picture, modal anti-realism seems to generalize to some sort of anti-realism concerning [*P*] for [*P*] which satisfy '*P* because □*P*', which seems hardly a welcome result.

Furthermore, one might think that a plausible modal anti-realism involves grounding [□*P*] in certain mental facts plus [*P*]. But this makes matters even worse, because in addition to not doing anything about the problematic (if partial)

127 See e.g. Schnieder (2011, 450f.) and Fine (2012, 59f.).

128 The circle also arises if the propositions □*P* and [In all p.w.: *P*] are identified. Something analogous holds for @*P* by *P*).

129 Cf. Kappes and Schnieder (2016, 556).

dependency of [*P*] on certain mental facts, it violates the irreflexivity of grounding. More generally, the idea that [□*P*] grounds [*P*] is inconsistent with what could be called '2-factor accounts of metaphysical necessity', according to which [□*P*] is grounded in [*P*] and a further element. For example, Sider (2011, ch. 12.2) can be understood as advancing a theory according to which a metaphysical necessity [□*P*] is reduced to [*P*] and a proposition stating that [*P*] belongs to certain class of propositions.[130]

Taking stock: Combined, the foregoing considerations provide a significant challenge for the relevant instances of '*P* because □*P*'. Although some of the considerations rely on more or less contentious assumptions about the grounds of metaphysical necessities, not only proponents of these assumptions may be confronted with the arguments, because one might think that the feasibility of explanation by modal status should be theoretically robust in the sense of not being threatened by such assumptions. So, in order to work the previous paragraphs into an argument against the instances of '*P* because □*P*' that does not rely on the contentious assumptions, one could argue that if the relevant instances of '*P* because □*P*' are in general true, this phenomenon should be more theoretically robust than the previous paragraphs suggest.

3.3 In favor of explanation by modal status

Let us now discuss some considerations in favor of explanation by modal status. First, certain instances of '*P* because □*P*' and maybe more so '[□*P*] explains [*P*]' do have some intuitive appeal. For example, in the right mindset, I can appreciate how 'God exists because they must exist' or 'The first law of thermodynamics holds because it must hold' may seem good candidate because-claims. Moreover, as we have seen in the introduction, a number of philosophers have put explanation by modal status to work. This bolsters the point from intuition, but it also motivates instances of '*P* because □*P*' by revealing their potential theoretically fruitfulness.

Ultimate explanation: Here is one respect in which explanation by modal status may be theoretically fruitful: Consider a necessary proposition [*P*] and the hierarchy of associated box-propositions [□*P*], [□□*P*], etc. again. Note first that it would surely be desirable to *somehow* explanatorily connect the iterated-box claims – the regress discussed in the previous section achieves this. Furthermore, there is a potential

130 Perhaps the friend of explanation by modal status could claim that modality is fundamental – or, more generally, they could perhaps claim that explanation by status only works for kinds of status that are fundamental. Perhaps an argument can be given here, but it also would have to be given. In any case, it would leave the other considerations untouched.

positive flipside to the regress: Some philosophers – for example Leibniz perhaps – think that explanation by metaphysical necessity is *ultimate*, i.e. such that with respect to its explanandum, no relevant why-questions are left unanswered by it.[131] This idea can be spelled out as follows: An explanation (or set of explanations) why *P* in terms of reasons Ω is ultimate iff all reasons why *P* contained in Ω are fully explained by reasons contained in Ω. *If* the explanatory regress in question is not vicious, then it may afford such an explanation.

Still, given that the regress does not seem particularly explanatorily valuable, it is unclear how desirable an ultimate explanation in the above sense really is. Moreover, according to Bliss (2013), explanatory regresses are vicious relative to an explanatory goal if they fail to afford that explanatory goal. So, at least with respect to the explanatory goal of "explaining away" necessity, the regress is vicious: According to it, it is 'boxes all the way down'.

Exceptional cases: There are instances of '*P* because □*P*' that arise from the combination of certain *prima facie* plausible grounding principles, for example:

(1) □ There are facts < It is a fact that □ There are facts < There are facts.

(2) □ There are *P* such that *P* < There are *P* such that *P*.

While these examples may involve grounding principles that are inconsistent with other plausible grounding principles (cf. Fine 2010 and Krämer 2013) and hence might have to be discarded anyways, more can be said here:

First, the intuitive worries with respect to the intended instances of '*P* because □*P*' can be upheld. Second, the examples somehow miss the point, because contrary to how it behaves in the intended instances of explanation by necessary status, the necessity of the propositions itself does not seem to play the right explanatory role in the present cases. To see this, consider for example (2): According to the underlying grounding principle, true existential generalizations into sentence position are fully grounded by their true instances.[132] But since, for example, [[There are *P* such that *P*] is also a true instance of [There are *P* such that *P*], it also fully grounds the latter.

So, in a sense, in this case it is not the *necessity* of [There are *P* such that *P*] (as opposed to e.g. its possibility) that explains why there are *P* such that *P*, it just happens to be the case that [□ There are *P* such that *P*, just like [◇ There are *P* such that *P*], is a true instance of [There are *P* such that *P*] and hence grounds it (analogous considerations hold for (1)).[133] Just as we would not conclude on the basis of the

131 Cf. Rundle (2004, ch. 5).

132 Cf. Krämer (2013).

133 Contrastivity might help clarify the point: In the present cases, it is not the case that its being necessarily the case that *P* rather than its being possibly the case that *P* explains why *P*, whereas

example that any truth is grounded in its being possible, we should not conclude on its basis that any necessary truth is grounded in its being necessary.[134]

'Being necessarily the case' as a determinate of 'being the case': To address the above arguments against instances of '[□*P*] grounds [*P*]', one might try to provide an account of how these *could* be true, i.e. how a fact [□*P*] could in principle be a ground for [*P*]. Here I want to consider one rationale for the corresponding grounding relation to obtain and for the logic of ground to be revised in a way that allows for them: Consider the idea that the properties expressed by 'is necessarily the case' and 'is contingently the case' are determinates of the same determinable, namely the property expressed by 'is the case'. This is not implausible, for being necessarily the case and being contingently the case seem to be different, more specific, and mutually exclusive ways of being the case. Plausible are also the corresponding grounding statements that follow, if we then apply the common assumption that instances of determinates ground instances of corresponding determinables:

(3) [[*P*] is necessarily the case] grounds [[*P*] is the case].
(4) [[*P*] is contingently the case] grounds [[*P*] is the case].

Note that given the plausible assumption that if [*P*] is the case, then [*P*] grounds [[*P*] is the case], we obtain two grounds for the fact [[*P*] is the case], namely [*P*] and either [[*P*] is necessarily the case] or [[*P*] is contingently the case]. With respect to making sense of the schema '[□*P*] grounds [*P*]', note that from the two schemata above the following do at least not obviously follow (let us use '○' as a sentential operator that expresses contingent obtaining):

(5) [□*P*] grounds [*P*].
(6) [○*P*] grounds [*P*].

I suspect that some of the appeal of (5) results from uncritically moving from (3) to (5). In any case, [*P* because contingently, *P*] appears quite implausible, but it seems to follow from the proposal for contingently true propositions [*P*]. Moreover, proponents of instances of '*P* because □*P*' often claim that the necessary status of propositions affords somehow particularly good explanations, but if explanation by necessity is understood as just sketched, it is unclear how the special

in the intended instances of explanation by status it is the case that its being necessarily the case that *P* rather than its being possible that *P* explains why *P*.

134 This gives us reason to suspect that the consideration involving the determination constraint from section 3.1 is not quite correct. I believe that this problem can be addressed by formulating a determination constraint for the case of explanation by status that is restricted in a way that excludes the problematic case above, see appendix A for more discussion.

quality of such explanations should be accounted for, given that contingent status would provide an analogous explanation.[135]

Taking stock: Intuition, the theoretical applications, as well as the promise of a kind of ultimate explanation lend support to the idea of explanation by status that should not be neglected. The extraordinary cases as well as the consideration from determinables and determinates moreover show how instances of '*P* because □*P*' with corresponding grounding relations *could* be made sense of. But we have also seen that neither consideration makes sense of the *intended* kind of explanation by status. Rather, they suggest that status propositions do not play the role of grounds (and perhaps more generally reasons why the explanandum obtains) in proper explanations by status.

3.4 Generalization and reactions

Let us see how the above generalizes to the cases of explanation by essential and law status, conceived of as instances of the schemata '*P* because it is an essential truth that *P*' and '*P* because it is a law of metaphysics (or nature) that *P*'. The considerations in favor of explanation by modal status generalize straightforwardly. The situation concerning the arguments against explanation by modal status is this: The intuitive doubts, the problem of grounding elimination, and the regress problem generalize.[136] The problem from reductive theories of modality only generalizes if there are suitable reductive theories of essence and lawhood. While it may be easy enough to formulate such theories, it is unclear how seriously they should be considered and how important their theoretical possibility is. While the case against explanation by essential and law status may thus be a little weaker than the case against explanation by modal status, it is still significant.

I now discuss two reactions to the above considerations for and against explanation by modal, essential and law status. The first denies that explanations by status exist. The second substitutes grounding by a different explanatory notion to figure in the links of these explanations. One can deny the existence of explanation by status and accommodate the underlying intuitions and motivations differently.[137] To this effect, Kappes and Schnieder (2016, 557f.) have suggested that the intuitive appeal of the relevant instances of '*P* because □*P*' could stem from pragmatic effects. For

135 See appendix B for some more thoughts on this.

136 The latter holds given the plausible assumption that essential and law status iterate. Cf. Fine (1995) for iteration of essential status.

137 Below I will sometimes only mention explanation by necessary status, but explanation by essential and law status are meant as well.

example, asking 'Why *P*?' may often conversationally presuppose that it is possible that not *P*, and in such a case, pointing out the necessary status of *P* may be a conversationally appropriate move: Not as an act of explaining why *P* and thereby giving a correct answer to the question, but rather as rejecting one of the presuppositions of the question. As Schnieder and I also mention, pointing out the necessity of a proposition can further epistemic goals (such as increasing the probabilistic coherence of one's belief-system) that explanation proper also often aims at. For example, explanation often serves the purpose of making facts less surprising, and pointing out that a fact is necessary may serve the same purpose: Coming to see that something could not have been otherwise may make it less surprising that things are that way.[138]

I consider these to be plausible fallback options should it turn out that explanation by status cannot be understood as explanation proper. Now, according to Glazier (2017a, 2017b), explanation by essential and modal status can be so understood, but not as grounding explanation, but rather as involving different *sui generis* explanatory relations.[139]

Some features of Glazier's proposal raise initial skepticism: First, because new explanatory relations are postulated, Glazier's proposal incurs corresponding ideological commitments.[140] Second, Glazier postulates his explanatory relations without stating much more than their being instantiated in the paradigmatic cases and their being distinct from grounding. Third, the postulated explanatory relations exhibit a weirdness that neither grounding nor, arguably, causation share: They form explanatory chains that necessarily have a final explanandum which is distinct in kind from its other elements (i.e. an explanandum that cannot explain a further proposition by standing in the same explanatory relation to it). This is the non-modal-box-prefixed or non-essential-box-prefixed proposition in which an explanatory chain of box-prefixed propositions that explain it terminates. Contrast this with the case of grounding, where each proposition grounds other propositions

138 Cf. Schupbach and Sprenger (2011).

139 Bertrand's (2019a, 2019b) "Explanation by Constraint" is closely related to explanation by essential status and his account of it bears some resemblance to Glazier's. For example, Bertrand also argues against understanding these explanations in terms of grounding. It would be interesting to investigate to what extent explanation by constraint could be captured by my own account. Thanks to an anonymous commenter for the paper on which this chapter is based.

140 Although of course, the explanatory advantages may be worth it. As we will see, my alternative proposal to model explanation by status as empty-base explanation might involve additional ideology besides grounding too, at least if certain cases (like the explanation by status of logical theorems) are to be captured. For more discussion see the next section and chapter 4. It is worth pointing out that this commitment can be avoided by 'explaining away' the intuitions in favor of explanation by status using the ideas mentioned above.

and with the case of causation, where it is plausible that each effect can at least in principle be a cause.[141]

Let us see to what extent the above discussion against explanation from status generalizes to Glazier's proposal: Intuitive doubts and an explanatory regress arise for this proposal too, but it avoids the problem from grounding elimination rules by stipulation. Insofar as reductive theories of modality are formulated in terms of grounding and not Glazier's *necessitarian explanation*, his proposal can avoid some of the problems for certain reductive theories of modality, but explanatory circles involving both grounding and necessitarian explanation still threaten to arise. Whether these are problematic is a matter we will turn to momentarily.

Now, note that the plausibility of the generality of the schema '*P* because □*P*' (and its variants involving other statuses) is not affected by assuming a different explanatory relation than grounding to be involved. Furthermore, the determination constraint argument above does not appear to rely on features of grounding specifically, but rather on features of complete metaphysical explanation more generally. In any case, Glazier (2017a) accepts the generality of the schema. Given this, one problem for BECAUSE-□ that he considers is that (as we have noted above) one might want iterated-box claims to be (grounding-) explained by single-box claims, which would result in explanatory circles: Single-box claims would be explained by iterated-box claims and iterated-box claims would be explained by single-box claims. To avoid this problem, Glazier suggests that the two explanations should be taken as explanations with different kinds of explanatory links: necessitarian explanation in the first case, grounding in the second. The suggestion is then that these two kinds of explanatory links are not in *harmony*, meaning that the disjunction of the two kinds of links need not satisfy structural properties such as asymmetry, irreflexivity, and transitivity, which are often ascribed to explanatory notions like grounding.[142] Thus Glazier can claim that circles involving only grounding explanations are inadmissible because of the asymmetry and transitivity of grounding, while allowing for circles comprised of different kinds of explanation, e.g. grounding explanation and necessitarian explanation.

Whether explanatory links in general need to obey harmony is still an open question, but the disharmony of grounding and explanation by necessity would result in a significant theoretical cost: Explanation by necessity has been suggested as a kind of ultimate explanation, perhaps with some sort of principle of sufficient reason in the background. Now suppose that [□*P*] '*explains-by-necessity*'

141 Below we will see that my own account avoids these problems.

142 The same point applies to the problems for certain reductive theories of modality mentioned above.

[*P*] and that [*P*] *grounds* [*Q*]. Then the most straightforward way of ultimately explaining [*Q*] would be by invoking transitivity, but since the two kinds of explanation are supposed to be in disharmony, this is not possible.

Perhaps there is another way to achieve the desired ultimate explanation: Supposing that [*Q*] is also necessary, [*Q*] can be explained by its own necessity.[143] But while each of [*P*] and [*Q*] is then explained by its own necessity, we do not obtain the more desirable result that both [*P*] and [*Q*] are explained in [*P*]'s necessity. Perhaps this result can be obtained by assuming that [$\Box P$] explains [$\Box Q$], but then the involved explanatory relation would have to be in harmony with necessitarian explanation to allow chaining it with the explanation of [*Q*] by [$\Box Q$]. Therefore it cannot be grounding, since, by assumption, grounding is not in harmony with explanation by necessity.

Let me give a concrete example: Plausibly, the existence of π grounds the existence of $\{\pi\}$. According to Glazier, both existence claims are explained in their necessity. But what we arguably desire is an explanation of the existence of $\{\pi\}$ by the necessity of the existence of π. Since this explanation cannot run via the existence of 2 grounding the existence of 2 (because explanation by necessity and grounding are not in harmony), it should presumably run via the explanation of the necessity of the existence of 2 by the necessity of the existence of 2. But if this relation is (as might also seem intuitive) grounding, then it follows that grounding and explanation by necessity are in harmony, violating the assumption.

Assuming that the relation is neither grounding nor Glazier's necessitarian explanation on the other hand seems ad hoc and unparsimonious. But it also cannot be necessitarian explanation because it does not involve explaining a proposition by its being necessary, which Glazier (2017a, 12) stipulates is required for necessitarian explanation. Furthermore, necessitarian explanation would mirror grounding in the sense that [*P*] grounds [*Q*] and [$\Box P$] explains-by-necessity [$\Box Q$]. But then it would be ad hoc if necessitarian explanation would not mirror grounding everywhere in the sense that for every necessary [*P*] and [*Q*], if [*P*] grounds [*Q*] then [$\Box P$] explains-by-necessity [$\Box Q$]. This again would face the following problem: According to the above assumptions, [$\Box\Box\Box P$] explains-by-necessity [$\Box\Box P$], and [$\Box P$] grounds [$\Box\Box P$]. But if necessitarian explanation mirrors grounding here, it also follows that [$\Box\Box P$] explains-by-necessity [$\Box\Box\Box P$], violating asymmetry.

Thus let us come to my proposal of treating explanations by status as empty-base explanations.

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143 We can simply stipulate [*Q*]'s necessity, but given grounding necessitarianism it follows if [*P*] *fully* grounds [*Q*].

3.5 Explanation by status as empty-base explanation

In this section I develop and defend my own account of explanation by status in terms of empty-base explanation. Above we have assumed that in explanations by status, the status proposition is a reason why the explanandum obtains (and hence would constitute the base of the corresponding explanation). For example, we have assumed that in the case of an explanation by necessary status, [□*P*] is a reason why [*P*] obtains, and correspondingly because □*P* should be the case.

But equipped with the notion of an empty-base explanation, we can drop this assumption and suggest that at least some proposals for explanation by status where [*P*] is explained by a fact or proposition of form '■*P*' (where '■' stands for the relevant operator) are best understood as empty-base explanations in which [■*P*] is not a reason why the explanandum [*P*] obtains, but the explanatory link of an empty-base explanation why *P*. As the reflections of the previous chapter show, this idea is independently plausible.

According to this proposal, explanations by status do not correspond to because-claims of the form '*P* because ■*P*', since the status proposition is not a reason why the explanandum obtains. Rather, as a link of an empty-base explanation, the status proposition underlies a because-claim of the form '*P* because ∅' (or '*P* just because'). Consider for example the idea that we can explain why the empty set exists by pointing out that it is a metaphysical law that the empty set exists. The answer to the corresponding why-question is that the empty set exists because ∅; or alternatively: The empty set exists *just because*.

In explanations by zero-grounding, the zero-grounding fact helps explain the explanandum in the capacity of explanatory link. Therefore, the explanatory role of a status proposition of the form '■*P*' in an explanation by status and the explanatory role of a zero-grounding fact in an explanation by zero-grounding are the same according to the present proposal. Hence, explanations by zero-grounding can be understood as a kind of explanation by status: In a zero-grounding explanation, the explanandum is explained by its status as a zero-grounded proposition. One notable result of understanding explanation by status as empty-base explanation is that the two ideas support each other: The notion of empty-base explanation allows us to better understand explanation by status, but likewise, the idea of explanation by status lets us better understand the notion of empty-base explanation and related ideas like zero-grounding. Intuitions about certain explanations by status being good, appropriate, or apt to create understanding why, thus also support the possibility of empty-base explanation and zero-grounding.

According to the present proposal, the metaphysical law involved in explanation by metaphysical law plays an explanatory role analogous to the role of a metaphysical law in an ordinary metaphysical-law-involving explanation, in

which a metaphysical law links an explanandum [*P*] and a reason why *P*. This seems intuitively correct, as well as theoretically more elegant and parsimonious than the rival proposals, which either forbid explanation by metaphysical law status or require stipulation of *sui generis* explanatory relations to locate the metaphysical law in the role of reason why rather than explanatory link.[144]

Having realized this for the case of explanation by metaphysical law, we should treat proposals for explanation by necessary or essential status analogously, since the status proposition in them plays the same explanatory role as the metaphysical law does in an explanation by metaphysical law status (that of an explanatory link). If explanation by essential status is possible, it should work analogously to explanation by metaphysical law status, namely conforming to the foil of empty-base explanation: The empty-base account of explanation by status naturally reveals explanation by metaphysical law and essential status as a special case of explanations in which metaphysical laws or certain essential dependence relations play the role of explanatory links. Given the account, there is no reason to assume that explanation by metaphysical law or essential status involves grounding claims of the form '[■*P*] grounds [*P*]' or analogous claims involving *sui generis* explanatory relations. In fact, if anything, the preceding observations seem to count against postulating such claims in order to account for explanation by metaphysical law or essential status.

Now, it turns out that the account of explanation by status as empty-base explanation predicts that explanation by *modal* status is not possible: Explanation by status conceived as empty-base explanation requires that the status propositions are explanatory links. For the cases of essential and law status I have made this assumption in the previous chapter, and we will take another look at essence-based explanatory links in the next chapter, but propositions expressing necessary status cannot be such links. The equivalent of these links in non-empty-base explanations would be strict conditionals, but there are well-known reasons against the thesis that metaphysical necessity is an explanatory notion and thus against the thesis that strict conditionals can be explanatory links.

For example, explanatory links are asymmetric, but modal dependence (as captured by strict conditionals) is not.[145] While one may perhaps accept *some* instances of symmetric explanation, modal dependence has *many* symmetric instances without

144 Recall the thought that links of empty-base explanations might have the form '■($\Gamma \rightarrow P$)', with 'Γ' standing for an empty plurality of propositions, rather than the form '■P'. If that is the case, a proposal for an explanation why [P] in terms of [■P] would best be understood as gesturing at a proper explanation in the vicinity, namely the empty-base explanation of P which has [■($\Gamma \rightarrow P$)] as its link.

145 Cf. Schnieder (2015) on the asymmetry of explanation and explanatory links, as well as further references.

corresponding explanatory connection; in general, explanatory links only connect explanatorily relevant relata, but strict conditionals also connect explanatorily irrelevant relata. For example: (i) modal dependence is reflexive, but explanation is irreflexive (perhaps given some exceptions); (ii) any two necessary truths are modally equivalent, but neither need explain the other; (iii) [snow is white] is true because snow is white and not vice versa, but [snow is white] and [[snow is white] is true] are modally equivalent; (iv) if [P] and [Q] are necessary and [R] is contingent, then [$P \wedge R$] and [$Q \wedge R$] are contingent, but necessarily equivalent and no explanatory connection seems to hold between them, at least if [P] and [Q] are explanatorily unconnected.

One might propose a two-component view according to which what should be taken as the explanatory link is a strict conditional together with a further element that ensures that the two conditions above are satisfied. But first, the onus would be on the friend of strict conditionals to develop such a view, and, second, taking a clue from Kim (1994), we may believe that explanatory links should somehow *account for* features of explanation such as irreflexivity, asymmetry and relevance. *Prima facie*, the proposed two-component view does a worse, because less unifying, job at this than views that propose explanatory relations like causation or grounding, which natively satisfy conditions such as asymmetry and relevance.

While I am thus inclined to discard the idea of explanation by modal status, it may (in addition to the options of section 3.4) often be possible to substitute proposals for explanation by modal status by viable proposals for empty-base explanations involving zero-grounding explanation, metaphysical law, or essence. Here, two advantages of my proposal over Glazier's are that by treating explanation by status as a special (namely empty-base) case of ordinary kinds of explanations, my proposal demystifies explanation by status and allows for a principled assessment of candidates for explanations by status as (empty-base) special cases of ordinary kinds of explanations. As a result of this, as is the case with explanation by modal status, not all proposals for explanation by status can be captured one to one. But given that this is the result of a principled assessment based on a well-motivated account, I take this to be an interesting result, rather than a cost. Expanding on this application of the empty-base account, I will show in the next section how van Inwagen's proposal for explanation by high probability can be assessed like this too.

But for now, let us consider now whether any of the problems for explanation by status discussed above carry over to explanation by status conceived of as empty-base explanation. Note first that the proposal deals well with the conflicted intuitive assessment of proposals of explanation by status: To an extent, intuition counts against explanation by status if we understand it as suggesting status propositions as reasons why, but it can count in favor of explanation by status if we understand the latter as empty-base explanation. One worry is that proposals for explanations by

status often do not satisfy the inquirers (perhaps because they lack a feeling of understanding why), but we should not dismiss explanation by status on this basis alone. First, rival intuitions exist to the effect that explanation by status *does* provide understanding why. Second, assuming that understanding why requires properly grasping an explanatory link (as e.g. Hills (2016) effectively argues), an explanation of the absence of understanding why in the relevant cases is available: The subjects in question do not properly grasp the relevant explanatory link. Third, subjects skeptical of attempts at explanation by status might expect an explanation with features that explanations by status do not have (e.g. reasons why its explanandum obtains). But then rather than being no explanation, as the subjects intuit, it is merely not the kind of explanation they desire.

Turning to the other considerations against explanation by status: The worry from the grounding elimination rules does not carry over, because no grounding relation between the explanandum and the status proposition is postulated. Concerning the regress worry we have to note that a sort of regress presumably arises. For instance, in the case of zero-grounding, a regress starts with a zero-grounded proposition if we assume that zero-grounding claims are themselves zero-grounded (cf. Litland 2017). This is not a regress of *reasons why* but a regress of explanatory *links*: Except for the first element of the regress, each element is a link in an empty-base explanation of the previous element. Where discussed, this regress is considered to be unproblematic.[146] A principled account of why a regress of grounds should be problematic but a regress of explanatory links not would clearly be desirable, but to my knowledge has not yet been given.[147] As far as I can see, the other problems for explanation by status do not arise for empty-base explanation.[148]

146 See e.g. Bennett (2011) and Litland (2017).

147 I admit that in the absence of such an account, there is a certain intuitive pressure to treat the two types of regresses equally. Note that if we do so and allow for regresses of reasons, the regress problem from section 3.2 would lose strength significantly.

148 Nevertheless, it may be interesting to think about the 2-factor-account problem for a bit. Suppose that a 2-factor-account of metaphysical lawhood is true. Then assume that it is a metaphysical law that P. Since we assume the 2-factor-account, this fact can be grounded in [*P*] and some [*Q*] taken together. Now, indeed, it being a metaphysical law that *P* (empty-base) explains why *P*, but [*P*] also (partially) grounding-explains (viz. is ground) why it is a metaphysical law that *P*: Apparently, we have a case of symmetric explanation, where a proposition [*P*] (partially) grounds a proposition [*L*], which in turn explains [*P*] by being a link of an empty-base explanation of [*P*].

I have two remarks on the situation: First, some suggest that there are explanatory links that are not in harmony such that there can be cases such that *P* is a reason why *Q* mediated by one explanatory link and *Q* is a reason why *P* mediated by another explanatory link – the idea is that the disjunction of the two kinds of explanatory relations involved in the links need not satisfy asymmetry while each relation does (see for example Bennett 2017 and Glazier 2017b). Second, note that we are not even dealing with a case of symmetric reasonhood: In our case, [*P*] is a

Before we wrap up the chapter by looking at two further applications of the empty-base account of explanation by status, let us address Rosen's (2017) argument (mentioned already in chapter 1) for cases in which a normative fact [Q] is (metaphysically) grounded in a non-normative fact [P] together with a normative law that connects [P] and [Q], which we can write as '[$\Box_{norm}(P \rightarrow Q)$]'. According to Rosen, considerations concerning the nature of normative facts and their plausible grounds motivate that sometimes the two elements of a (normative) covering law explanation involving initial condition ([P]) and normative law ([$\Box_{norm}(P \rightarrow Q)$]) together ground the explanandum ([Q]) of said covering law explanation. His motivation is to find metaphysical grounds for particular moral facts, such as [act a is permissible], while assuming that no fully non-normative, non-moral grounds for such facts exist, and yet avoiding having to concede that any particular moral facts are fundamental.

If Rosen is correct about this, there is a kind of explanation, namely normative covering law explanation, where the explanatory link always also is a reason why the explanandum obtains, because the link is a partial ground of the explanandum. Moreover, if there could be normative laws of form '$\Box_{norm}(Q)$' or '$\Box_{norm}(\Gamma \rightarrow Q)$' with 'Γ' standing for an empty plurality of propositions, then Rosen's account would suggest that these laws ground [Q], which would constitute an explanation by normative law status with grounding fact as explanatory link. Here, I am interested in whether accepting Rosen's suggestion affects what I say here about explanation by status: Should we, if we assume that normative laws partially ground explananda of normative covering law explanations, therefore reconsider modeling explanations by status as grounding explanations of form 'P because $\blacksquare P$'?

I think we should not: First, it is doubtful that there are normative laws that would generate instances of 'P because $\blacksquare P$'. Second, even if there are, we could still treat them as a curiosity concerning normative laws (although some pressure on what I say above would be hard to deny in that case). Third, and most importantly, my positive proposal as to how to understand proper explanations by status will stand in any case. The result might then be that there are two kinds of explanation by status, namely explanation by status as empty-base explanation as I propose below, and Rosen-style (partial) grounding by law.

Rosen's suggestion is to add normative laws to non-normative facts to obtain a grounding base for particular normative facts (a similar role has been suggested for social norms/laws in grounding the existence of certain social entities, cf. Epstein 2015, chs. 6 and 7). While these laws (according to Rosen) also play a distinct

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reason why the law obtains, but not vice versa: The law explains why P, but as a link of an empty-base explanation of P. For more discussion of a similar kind of phenomenon, see chapter 6.

(link-like) role in *normative* explanations, their role in grounding explanations of particular normative facts is that of a ground that adds the required normativity to the otherwise non-normative base facts. This contrasts nicely with the explanations by status I have been discussing, in which the (law-like) status propositions play the role of explanatory link (and not also ground or also explanatory link of a further kind of explanation of the relevant explanandum).

3.6 Two more applications of the account

Finally, let us look at two further applications of the empty-base account of explanation by status. The first concerns the idea of explanation by (high) probability, while the second concerns the explanatory relations between laws, universal generalizations and their instances (see for example Roski 2018 and the papers cited therein).

Explanation by probability: According to van Inwagen (1996), we can (at least sometimes) explain why *P* by citing that it is (objectively) very probable that *P*. In his paper, van Inwagen combines this idea with an argument to the conclusion that in some sense it was (objectively) very probable for there to be something (rather than nothing) to attempt a probabilistic explanation by status of why there is something rather than nothing. Like explanation by necessary status, we can use the empty-base account of explanation by status to assess van Inwagen's proposal for explanation by high probability.

In order to do so, first we have to decide what kind of explanatory link van Inwagen's probability facts correspond to: What kind of probabilistic fact plays the role of link in the corresponding non-empty-base explanations? Presumably, it will be some kind of probabilistic conditional (or universal generalization containing such a conditional) that expresses something along the lines of "if the antecedent is true, then it is objectively very probable that the consequent is true as well". Alternatively, we could consider a proposition that expresses that the objective conditional probability of the explanandum given the explanatory base is very high.

Second, we have to ask whether such facts can play the role of explanatory link at all. Here, for reasons analogous to those in the case of explanation by necessary status, the answer appears to be no: For example, the first of the above notions fails to capture explanatory relevance, since if it is already objectively very probable that *Q*, then whatever the antecedent, it will be true that if the antecedent is true, then it is objectively very probable that *Q*. For conditional probability observe for example that oftentimes if the conditional probability of the explanandum given the explanatory base is very high, it can still be the case that the conditional probability of the explanatory base given the explanandum is very high as well (or even higher), threatening anti-symmetry: For example, the existence of a painting

created by dropping paint onto a canvas in windy conditions might plausibly be explained by the artists dropping said paint. We can assume that the conditional probability of the existence of the painting given that the artist drops paint is high, but far from 1 (because the windy conditions might interfere, say). On the other hand, given plausible assumptions about the nature of paintings, the probability of the artist's dropping paint given that the painting exists is 1: This painting in particular could not have come to exist in any other way.

Thus, mere probabilistic conditionals or facts about conditional probability, and by extension facts about high probability, cannot be explanatory links. But of course, probabilistic laws (say, of nature) can do the trick. A more thorough assessment of van Inwagen's specific proposal should thus investigate whether his high probability claim can be understood as (an instance of) such a probabilistic law. It is worth contrasting this assessment with a related account of how chance explains by Hicks and Wilson (2021), according to whom (in a nutshell) chance facts play the role of higher-order reasons why in Skow's sense (compare my discussion in chapter 1).[149] It may seem that this proposal is confronted with issues similar to those just pointed out: It is unclear how mere chance facts can account for explanatory direction and relevance, and thus unclear how they could serve as higher-order reasons why. But this would be too quick: On the one hand, it appears that Hicks and Wilson do indeed at least sometimes have probabilistic laws of nature in mind (rather than mere probabilistic facts), as would be my preferred approach. On the other hand, they can attempt to adopt an analogue of what I called '2-factor-accounts' above, according to which the mere probabilistic facts are only partial higher-order reasons why and need to be accompanied by other (partial) higher-order reasons why (still to be identified) that help account for explanatory direction and relevance.

Explanatory relations between laws, universal generalizations and their instances: Here is an attempt at capturing the idea that laws can explain corresponding universal generalizations, which uses the idea of an explanation by law status, understood as an empty-base explanation involving laws: Consider a universal generalization $[\forall x(Fx \rightarrow Gx)]$ and a corresponding law $[\Box_L \forall x(Fx \rightarrow Gx)]$. Above I proposed that a law of form '$\Box_L P$' is a link of an empty-base explanation of $[P]$. But then, $[\Box_L \forall x(Fx \rightarrow Gx)]$ is not only a link for explanations of facts of form '*Fx*' in terms of facts of form '*Gx*', but also a link of an empty-base explanation

149 See especially the section on *null-explanation* that includes a potential example for a candidate empty-base explanation by (probabilistic) law of nature involving real-world science (in this case Boltzmannian statistics), for more discussion see chapter 5.

why [$\forall x(Fx \rightarrow Gx)$], since [$\Box_L \forall x(Fx \rightarrow Gx)$] has form '$\Box_L P$' which can be seen by substituting '$\forall x(Fx \rightarrow Gx)$' for '$P$'.[150]

If this proposal is correct, propositions of the form '$\Box_L \forall (Fx \rightarrow Gx)$' can figure as links in two different kinds of explanations: First, they can (as usual) be links of explanations why Gx (for appropriate x), and now according to the present proposal they can also be links of empty-base explanations why $\forall x(Fx \rightarrow Gx)$. But perhaps matters are a little less straightforward than this. Recall that in chapter 2 section 3 I suggested that the links of law-involving empty-base explanations may not have the form '$\Box_L P$', but rather '$\Box_L(\Gamma \rightarrow P)$', with 'Γ' standing for an empty plurality of reasons.[151] In that case, rather than [$\Box_L \forall x(Fx \rightarrow Gx)$] empty-base explaining why $\forall x(Fx \rightarrow Gx)$, it is the related law-proposition [$\Box_L(\Gamma \rightarrow \forall x(Fx \rightarrow Gx))$] that empty-base explains why $\forall x(Fx \rightarrow Gx)$.

3.7 Conclusion

The account of explanation by status as empty-base explanation defends and develops the practice of explanation by status as a limiting case of ordinary explanation and thereby removes some of the mystery surrounding the practice. Three virtues of the account are that (i) it allows for the possibility of explanation by status as a proper kind of explanation, (ii) it achieves this without postulating *sui generis* explanatory relations, and (iii) it provides a method to determine which kinds of status allow for a corresponding kind of explanation by status.

Appendix A: More on the determination constraint argument

DeRosset's (2013a) determination constraint on full grounding is this:

(Determination Constraint)
An explanatory proposal of the form 'd has feature F because $\phi(d, a_1, \ldots, a_n)$' is at best incomplete if there is or might have been a confounding case for it: an

150 Cf. Lange (2009b), who endorses that laws of the form '$\Box_L P$' explain facts of the form 'P', but takes the relevant relation to be a becausal one.
151 Or the quantified version: '[$\Box_L \forall x(\Gamma \rightarrow Gx)$]'.

entity *e* and some entities $a_1, \ldots, a_n$ such that *e* (together with $a_1, \ldots, a_n$) satisfies $\phi(y, x_1, \ldots, x_n)$ but lacks *F*.[152]

I suggest that the Determination Constraint can be strengthened as follows:

(Determination Constraint*)
An explanatory proposal of the form '*d* has feature *F* because $\phi(d, a_1, \ldots, a_n)$' is at best incomplete if there is or might have been a confounding case* for it: an entity *e* and some entities $a_1, \ldots, a_n$ such that *e* (together with $a_1, \ldots, a_n$) satisfies $\phi(y, x_1, \ldots, x_n)$ but it is not the case that *e* has feature *F* because $\phi(e, a_1, \ldots, a_n)$.

Note how the proposal is strengthened by adopting the notion of a confounding case*: To take an easy example, a confounding case* of an explanatory proposal '*Fa* because *Ga*' would be a *b* such that *Fb*, but '*Fb* because *Gb*' is false. Of course, one way for this to be so is for '*Fb*' to be true and for '*Gb*' to be false – this is what the original Determination Constraint captures. But according to Determination Constraint*, another possibility is for '*Fb*' and '*Gb*' to be true, but for '*Fb* because *Gb*' nevertheless to be false.

The Determination Constraint* seems to be a good candidate for a stronger principle that underlies the Determination Constraint. One intuition that motivates the Determination Constraint seems to be something like this (for a simple case): '*Fa* because *Ga*' is only complete, if for any *x*, its being *F* ensures its being *G*. Now I think the most plausible candidate for the notion of ensurance is not a merely modal one, but an explanatory one, and this is captured by the Determination Constraint*: The idea is that if '*Fa* because *Ga*' is complete, then not only is it the case that *a*'s being *F* explains *a*'s being *G*, but necessarily, anything's being *F* explains its being *G*. Indeed, it would be strange to accept Determination Constraint but to reject Determination Constraint*: Why would *a*'s being *F* explaining *a*'s being *G* only require a necessary connection between being *F* and being *G* in cases of other entities than *a*? Why would it require such a connection at all? It seems better to accept Determination Constraint* as well. Note in passing that the Determination Constraint* is related to the idea that explanatory links (of the relevant form) need to correspond to laws or have a certain law-like character.

Observe now that given Determination Constraint*, we obtain the following result:

– If there is a *p* for which *p* is true because *p* is necessarily true, then for all necessarily true *p*, *p* is true because *p* is necessarily true.

152 For the record: I have some concerns about the determination constraint in this formulation, stemming in part from the conclusion that deRosset uses it to argue for. Nevertheless, the observation it attempts to capture seems to be important.

For if there is a p for which p is true because p is necessarily true but also a necessarily true q for which it is not the case that q is true because q is necessarily true, then q is a confounding case*, and so the explanatory proposal is at best incomplete. This already can be considered to support the following corresponding principle at which we want to arrive, although it is not quite clear how to bridge the remaining argumentative gap:

– If there is a P for which P because $\Box P$, then for all P such that $\Box P$, P because $\Box P$.[153]

I think we can do a little better. It seems plausible that certain further generalizations of the Determination Constraint* should be possible. Thus one might think that we can straightforwardly extrapolate from the strengthened version of deRosset's predicational version to the following operational version, where '' stands for a sentential operator:

(Operational determination constraint*)
An explanatory proposal of the form 'P because $^*P$' is at best incomplete if there is or might have been a confounding case* for it: a proposition [Q] and an operator '*' such that it is the case that Q, but it is not the case that Q because $^*Q$.

Prima facie, this seems as plausible as the Determination Constraint*. But if the Operational Determination Constraint* holds, then it follows that the scope of the schemata for explanation by status has to be unrestricted (that is, only restricted to those propositions that have the status in question), for otherwise the constraint would be violated.

Alas, a further complication arises – there is reason to believe that the Operational Determination Constraint* is not quite true: As we saw in section 3.3, there might be true instances of 'P because $\Box P$' in which, in a sense, it is not [P]'s necessity that 'does the explaining' – in these cases, the necessity operator could for example be exchanged by a possibility operator. But we should be reluctant to conclude from the truth of *these* instances of 'P because $\Box P$' that all its instances that have true relata are also true. To address this problem, the most straightforward fix of the constraint for the case of necessity is perhaps the following:

153 Here I quantify into sentential position using 'P' as a corresponding variable. We can use schema-talk instead and say that the principle supported is that if there is one true instance of the schema 'P because $\Box P$', then every instance of 'P' that satisfies '$\Box P$' also satisfies 'P because $\Box P$'.

(Revised operational determination constraint* for '□')
An explanatory proposal of the form '*P* because □*P*' *in which it is [P]'s necessity that is supposed to do the explaining* is at best incomplete if there is or might have been a confounding case* for it: a proposition [*Q*] such that it is the case that □*Q*, but it is not the case that *Q* because □*Q*.

Appendix B: More on 'being necessarily the case' as a determinate of 'being the case'

One might argue as follows that something like determinate-determinable grounding can obtain for our sentential operators: Consider the sentential operators '□' for metaphysical necessity, '○' for metaphysical contingency and '$\cdot$' defined by '$\cdot P$ iff *P*'. If we could, somehow, generalize the idea of determinates and determinables to sentential operators such as these, then it may be plausible to say that '□' and '○' are determinates of '$\cdot$'. Given the assumption that 'determinates ground determinables', one would get the result that if □*P*, then [□*P*] grounds [$\cdot P$] and that if ○*P*, then [○*P*] grounds [$\cdot P$]. Finally, if the factual equivalence of [$\cdot P$] and [*P*] could be established, it would follow (for the right kind of grounding and right strength of factual equivalence) that if □*P*, then [□*P*] grounds [*P*] and that if ○*P*, then [○*P*] grounds [*P*]. This would account for the alleged explanatory grounding connection between [□*P*] and [*P*].

Related to this is the idea that facts may be fundamentally divided into two classes: the necessities and the contingencies. Generalizing the notion of determinable and determinate properties to facts in a similar fashion as above, one might think that the necessities and the contingencies are determinates of a sort of neutral facts. Assuming that '□*P*', '○*P*', and '*P*' express the relevant necessity, contingency, and neutral fact respectively, the determinate-determinable relation between the facts would then be mirrored by the grounding relations given in the previous paragraph.

To flesh out these ideas, clearly a lot more would have to be said: Amongst other things, a treatment of iterated occurrences of '□' and '○', as well as a new logic of grounding and the interplay of grounding, modal operators, and truth-functional operators would have to be developed. In any case, [*P* because contingently, *P*] appears quite implausible, but it follows from the proposal, if [*P*] is contingently true. As we have seen, proponents of instances of '*P* because □*P*' have often claimed that the necessary status of certain propositions affords an in some way particularly good explanation. But if explanation by necessary status is understood as just sketched, it is unclear how the special quality of such explanations should be accounted for. Supposing we allow '□' and '○' to be iterated, one might think that the infinitely

descending grounding chain [P], [$\Box P$], [$\Box\Box P$], . . . can secure the special explanatory status.[154] But this would be incorrect, since if [$\circ P$] is the case, then [$\circ \circ P$] is also the case and an analogous grounding regress could be constructed, and the special status of the box-involving regress would have to be accounted for differently.

154 It is unclear to me whether on the proposed picture, iterated modalities should be allowed. For we assumed that [$\Box P$] determines [P] and [Q] determines [Q]. Now one might think that analogously, [$\Box\Box P$] determines [$\Box P$], and [$\circ\circ Q$] determines [Q], and so on. It is unclear though whether this idea can be made sense of, because this would mean that [$\Box P$] (or [Q]) only has one determinate [P] (or [$\circ\circ Q$]), because [$\Box \circ P$] (or [$\Box \circ P$]) is impossible, assuming S4 modal logic. But it is unclear in what sense we can speak of determination, if there necessarily is only one 'determinate'.

4 Explanation of Logical Theorems

The main focus of this chapter is to explore how logical theorems may be explained. In section 4.1 I argue that their ordinary grounding explanations do not appear to be completely satisfactory and identify desiderata for more satisfactory explanations. In section 4.2 I consider and criticize two proposals for extraordinary grounding explanations: grounding explanation by status and explanation by zero-ground. In section 4.3 I then offer several ways in which we might deal with the apparent failure of grounding to provide satisfactory explanations of logical theorems, and argue that empty-base explanations that do not involve grounding could satisfy the desiderata without running into the problems that confront grounding explanations. In the remainder of the chapter I explore two ways to implement this idea: First, in section 4.4 I develop Yablo's (2014) account of reductive truthmaking to allow for a kind of empty-base explanation of logical theorems by reductive truthmaking.

Second, in section 4.5 I turn to the idea of explanation by essence, according to which logical theorems can somehow be explained using essences. I discuss some attempts to address the primary challenge here, namely to make sense of an essence-involving explanatory notion whose instances of do not entail corresponding grounding statements. While I focus on finding kinds of explanations that afford more satisfactory explanations for logical theorems than grounding does, we will see that the applications of the alternative explanatory notions to be discussed may not be confined to the explanation of logical theorems; for example, I will argue that the existence of a certain (non-grounding-entailing) kind of explanation by essence is likely to have significant upshots for other areas of philosophy, including philosophy of mind and the mind-body problem.

Furthermore, in chapter 3 I argued that proposals for explanations by essence (i.e. proposals that try to explain why P in terms of it being part of some essence that P) should best be understood as empty-base explanations featuring essential conditionals or some other kind of essence-involving propositions as their explanatory links. The discussion of explanation by essence in this chapter attempts to better characterize these essence-involving explanatory links.[155]

Finally, the chapter concludes with section 4.6 and a look at some remaining options for non-grounding-explanations of logical theorems.

155 For the sake of convenience, unless stated otherwise, schematic letters and formulae like 'P' and '$P \vee \neg P$' will be used both in sentence position and to (schematically) refer to the corresponding propositions in this chapter.

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4.1 Ordinary grounding explanations and why they might be unsatisfactory

Our question is how logical theorems such as $P \vee \neg P$, which will be our schematic example, can be explained. More specifically, our goal is to answer why P for every logical theorem P – hence, to answer why $P \vee \neg P$ (for instance, why the sun is shining or it is not the case that the sun is shining). Since, as we may assume, the desired explanation is not a causal one, it is natural to turn to grounding explanation. Indeed, a standard kind of grounding explanation for logical theorems is readily available: For example, the logic of 'because' in Schnieder (2011) and the logic of ground in Fine (2012) specify grounds for logical theorems of classical first-order logic.

According to these proposals, the grounds of a logical theorem are propositions that correspond to some of the atomic formulae (or negations thereof) into which the formula that expresses the logical theorem can be decomposed, namely those that make the logical theorem true – ground it – on a given occasion. For example, since in general a disjunction is grounded in its true disjunct, a logical theorem of the form of $P \vee \neg P$ is grounded in and hence can be explained by its true disjunct, with the corresponding because-claim being '$P \vee \neg P$ because P' or '$P \vee \neg P$ because $\neg P$', depending on whether P or $\neg P$ is true.[156] Call this kind of explanation the 'ordinary grounding explanation'. To give a concrete example, given that the sun is shining, [the sun is shining or it is not the case that the sun is shining] is fully grounded in [the sun is shining].[157] Correspondingly, given that the sun is shining, the sun is shining or it is not the case that the sun is shining because the sun is shining.

As for instance Schnieder (2011, 457f.) observes, these ordinary grounding explanations may not seem completely satisfactory. For example, one might have thought that logical theorems are a good candidate for truths that possess some sort of special, perhaps somehow particularly good, explanation. Some desiderata that may be the source of this idea are that a satisfactory explanation of logical theorems should

156 I will assume here, as I have elsewhere, that the truth of the grounding claim is sufficient for the truth of the corresponding because-claim.

157 As always, I use square brackets to refer to the proposition expressed by the sentence within the brackets. For the sake of convenience, I sometimes use a predicational idiom of grounding and assume grounding to relate propositions; no commitment as to the nature of grounding's relata, if any, and concerning operatorational versus predicational views of grounding is intended by this. Cf. Correia and Schnieder (2012, sec. 3.1) for the distinction between these two views.

1. somehow also account for their necessity or their status as logical theorems,
2. be modally stable in that it holds with necessity,
3. give rise to no, or just very few, or not especially pressing further why-questions, or
4. be compatible with certain non-classical logics in which e.g. $P \vee \neg P$ can be true without either of its disjuncts being true.

It is clear that ordinary grounding explanations do not satisfy these desiderata: An ordinary grounding explanation of, say, $P \vee \neg P$ in terms of its true disjunct gives rise to the question why this disjunct obtains and hence to all the why-questions that an explanation of that disjunct gives rise to. Since the disjunct is arbitrary, no special explanatory status with respect to what further why-questions arise in that fashion seems available for $P \vee \neg P$, if it only has an ordinary grounding explanation. There also appears to be no sense in which the ordinary grounding explanation could account for the necessity of $P \vee \neg P$ or its status as a logical theorem. After all, $P \vee \neg P$ has the same kind of ordinary grounding explanation as any true disjunction. Since the ordinary grounding explanation of a disjunction proceeds through its disjuncts, it also fails to be modally stable: If P is contingent, $P \vee \neg P$ will be grounded in P if P is true, and in $\neg P$ otherwise. For the same reason the fourth desideratum fails for ordinary grounding explanations: If $P \vee \neg P$ is to be explained in a setting in which it can be true without either P or $\neg P$ being true, then ordinary grounding explanations will not do.[158]

Before we continue, let me note that it is not clear that there *must* be explanations for logical theorems that satisfy (one or more of) the desiderata – for example, perhaps the status of logical theorems as logical theorems can be accounted for by explaining not the theorems themselves, but rather explaining why they are logical theorems. It is also not clear that necessary truths should require necessary explanations if it is necessary that they do have an explanation, just not the same in every possible circumstance. Nevertheless, I will take the dissatisfaction with the ordinary grounding explanations as a datum and attempt to find (additional) alternative explanations for logical theorems that satisfy the desiderata just identified.

158 I consider the fourth desideratum to be weaker than the first three, but I take these to be compelling on their own in any case.

4.2 On extraordinary grounding explanations

On reflection, two proposals for alternative grounding explanations of logical theorems readily come to mind: First, there is the idea that logical theorems might somehow be grounded in (and thereby explained by) propositions expressing their status as logical theorems, their being logical or metaphysical laws, or their being part of certain essences. Following the discussion in chapter 3, call these proposed explanations 'explanations by status' and the mentioned status-expressing propositions 'status propositions'.[159] The corresponding because-claims would then have the form '$(P \vee \neg P)$ because $\blacksquare(P \vee \neg P)$', where '$\blacksquare$' is a placeholder for the respective status-expressing operator.

According to the second proposal that comes to mind, logical theorems are zero-grounded. For readers who have skipped chapter 2, let me say a little bit about the notion of zero-ground: Normally, metaphysical grounding is taken to be a relation (or at least something approximately like a relation) between a plurality of propositions or facts, the *grounds*, and a single proposition or fact, the *grounded* proposition/fact or *groundee*. Zero-grounding is a limiting case of grounding in which 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/facts.[160]

More precisely, if we assume grounding statements to have the form '$\Gamma < \phi$', then since in the case of zero-grounding statements, the 'Γ' stands for an empty plurality of grounds, statements of zero-grounding have the form 'ϕ'. Alternatively we might express zero-grounding using sentences of the form '$\varnothing < \phi$'. As for the corresponding because-statements, we can adopt a similar convention and use '$\varnothing$' to stand for the empty set of grounds, which gives us '$P \vee \neg P$ because $\varnothing$'. Somewhat tongue-in-cheek, we will take and adapt the natural language expression 'just because', giving us '$P \vee \neg P$ just because'.[161]

Intuitively, at least, both proposals promise to scratch an explanatory itch that the ordinary grounding explanations do not address: They do, in some sense, account for the special status of logical theorems, they are necessary, they satisfy the alternative-logics desideratum, and (as we have seen in chapter 3) at least

159 A conceivable related option that I will not address is that while logical theorems cannot in general be explained by propositions expressing *their* status, they can be explained by other status propositions.

160 The notion of zero-ground has been introduced by Fine (2012, 47f.). One prominent application of the notion is Litland's (2017) account of the grounds of ground, but see also Donaldson (2017), Muñoz (2020), De Rizzo (2020), and Litland (2022).

161 I discuss the nature of this explanatory proposal further in section 4.3.

explanation by status has been considered by some to be an – in some way or other – especially good kind of explanation.[162]

One way to spell out the latter point is to focus on the idea that logical theorems are grounded in propositions that express their status as essential truths and to adopt Dasgupta's (2014b) idea that such propositions are explanatorily autonomous, i.e. not in need of any explanation. The grounding explanation of logical theorems in question would then be particularly good because according to it, logical theorems are grounded in propositions which themselves do not require any further explanation. Quite similarly, the zero-grounding proposal promises particularly good explanations of logical theorems in that the relevant explanatory candidates do not involve any grounds of logical theorems at all for which further explanations could be demanded.

That the proposals promise to satisfy the other desiderata can be seen as follows. First, the proposal for explanation by status accounts for the special status of logical theorems by employing that very status in explaining logical theorems. This status can then, so to speak, be read off these explanations of logical theorems. The desideratum for modal stability is satisfied by the proposal for explanation by status because the status propositions are necessary and the (at least in this context) eminently plausible principle that grounding is non-contingent, according to which if propositions Γ together ground Q, then necessarily, if all propositions Γ are the case, then the Γ together ground Q.[163]

According to the zero-grounding proposal on the other hand, logical theorems are grounded in the empty plurality of grounds. Since all propositions in the empty plurality of grounds are necessarily the case, this, together with the principle that grounding is non-contingent, also results in logical theorems being necessarily zero-grounded. In the same way, the necessary status of logical theorems can be read off their proposed zero-grounding explanations, whereby this proposal also satisfies the first desideratum. Moreover, the special status of being zero-grounded itself can be read off the proposed zero-grounding explanations: According to the proposal, logical theorems do not only logically follow from zero premises, they are also grounded in and hence explained by zero premises. Finally, the alternative-logics desideratum can be satisfied by both proposals simply because they offer grounds for logical theorems that obtain even if we assume that, e.g., $P \vee \neg P$ obtains without either P or $\neg P$ obtaining.

162 This idea is common in the literature on why there is anything at all, in which explanation by necessary status is often taken to be of particular explanatory value. Cf., e.g., Goldschmidt (2013).

163 For the principle, cf. Correia and Schnieder (2012, 21ff.).

A shared drawback of these two proposals for extraordinary grounds of logical theorems is that they both conflict with Fine's (2012, 63f.) attractive account of the logic of ground, according to which conjunctions can only be grounded via their conjuncts and disjunctions can only be grounded via their (true) disjuncts.[164] According to this assumption, our example $P \vee \neg P$ can also *only* be grounded via its true disjunct. Since the alternative grounds proposed above are not in general either the true disjunct of $P \vee \neg P$, nor do they ground it, these proposals are ruled out by the present assumption. Note in particular that this is also true for the zero-grounding proposal: According to the assumption, $P \vee \neg P$ can only be zero-grounded if one of its disjuncts is zero-grounded. But of course, only in very specific instances will the true disjunct of a disjunction be zero-grounded (or grounded in the relevant status-expressing proposition).

As I have argued in chapter 3 though, understanding explanations by status as advancing the status propositions as *grounds* of their explananda is problematic for a number of further reasons. Instead, I proposed that explanations by status should best be understood as hinting at empty-base explanations. Given that we are currently looking for a more satisfactory, extraordinary *grounding* explanation of logical theorems, this would mean endorsing the view that logical theorems are empty-base grounding explained and hence zero-grounded, and hence still incur the above problem from the logic of ground.

4.3 What to do?

Let us consider some possible reactions to this difficulty:

1. Accept that despite intuitive appearance to the contrary, an explanation of logical theorems that does not proceed via the ordinary grounding explanation cannot be had. Additionally, it might be argued against the need for any additional explanation.[165]
2. Change the target: Perhaps a more satisfactory explanation can only be had for a proposition in the vicinity of $P \vee \neg P$. One salient candidate would be to

164 More specifically, the logic of Fine (2012) captures this idea by postulating elimination rules for the impure logic of ground, for instance the rule E. But the insight is more general than this implementation, it is for example also contained in Fine's (2017b) account of grounding in terms of truthmaking.

165 A notable variant of this reaction would be to suggest that while no more satisfactory explanations *why* of logical theorems can be had, perhaps other kinds of explanations *wh-* such as explanations *what* can be had. For a recent application of the distinction between explanation *why* and explanation *what* in metaphysics see Skiles (2019).

explain why certain status propositions obtain, such as the propositions that it is a logical theorem, a necessary truth or a metaphysical law that $P \vee \neg P$ (rather than explaining why $P \vee \neg P$).

3. Revise the logic of ground to allow for more diverse – extraordinary – grounds for logical theorems.
4. Find a different explanatory notion that allows for a more satisfactory explanation of logical theorems than grounding does.

I have some reservations with respect to the first three options: First, it seems that we should only, despite appearance, accept that no more satisfactory explanation can be had and try to explain away the need for a better explanation, if indeed no alternative candidate is available. As a matter of fact, such a candidate may be available, as I will argue below. With respect to the second option, I have a similar reservation: While it is an interesting question what, if anything, explains truths expressible by sentences of the form 'It is a logical theorem that . . . ', I first want to investigate whether a more satisfactory explanation of logical theorems themselves can be found.

With respect to a revision of the logic of ground, I have the following reservations: First, the logic as it is is neat and somewhat intuitively motivated. Second, there is some reason to suspect that if we try to change the principles of the logic of ground, we end up talking about different propositions involving different operators and nothing has been won with respect to our original question. The thought is this: According to Fine (2017a), propositions can be defined in terms of their exact truthmakers. But to postulate an extraordinary ground of a logical theorem P in addition to its ordinary grounds is, in effect, to change its set of exact truthmakers.[166] So it seems that we would be dealing with two propositions: The proposition P_1 that only has the ordinary grounds and associated exact truthmakers, and the proposition P_2 that additionally has the extraordinary ground and associated exact truthmakers. But what we were interested in was not an explanation of P_2, but an explanation of P_1.

Here, it could be objected that our goal was to find satisfactory explanations for propositions such as [the sun is shining or it is not the case that the sun is shining] and that Fine's theory is simply mistaken about what truthmakers this proposition has. Nevertheless, the following problem remains even if we admit that [the sun is shining or it is not the case that the sun is shining] has extraordinary grounds and associated truthmakers. For what about the proposition, call it

166 See Fine (2017b) on the definition of grounding in terms of exact truthmakers, which, like Fine (2012), captures the idea that disjunctions can only be grounded via their true disjuncts.

P_1, that according to the objection Fine mistakenly identified with [the sun is shining or it is not the case that the sun is shining], and which shares all truthmakers with this latter proposition except those required for its having extraordinary grounds? Plausibly, this proposition is also a logical truth for which we would like to have a satisfactory explanation, yet by assumption it cannot have extraordinary grounds. Of course, this argument could be resisted by denying that propositions like P_1 exist, but it is not clear to me on which basis.[167]

Third, if we revise the logic of ground to be more permissive, logical theorems will have ordinary grounds (those they had all along) and extraordinary grounds (those that are required for the more satisfactory explanations of logical theorems). Then the question arises how extraordinary grounds can be characterized and how the difference between ordinary and extraordinary grounds can be accounted for.

In the remainder of this chapter, I will primarily pursue the fourth option. To approach the idea, let us take a step back and consider the zero-grounding proposal once more. As I have argued in chapter 2, explanations by zero-ground are instances of the more general phenomenon of empty-base explanation. And as I have argued in section 4.2, the structure of zero-grounding explanations is suitable to satisfy the desiderata for explanations of logical theorems. But it is now clear that it is more generally the case that the structure of empty-base explanation allows for the satisfaction of the desiderata:

Just like the zero-grounding proposal, empty-base explanations more generally promise particularly good explanations of logical theorems in that the relevant explanatory candidates do not involve any reasons why logical theorems obtain for which further explanations could be demanded. According to the empty-base proposals in general, logical theorems are explained in an empty plurality of propositions (i.e. reasons why the relevant logical theorem obtains). Since all propositions in the empty plurality are necessarily the case, this, together with an assumption to the effect that the relevant explanatory notion is non-contingent (understood in analogy to the principle of non-contingency of grounding assumed above), also results in logical theorems being necessarily empty-base explained.

Likewise, the necessary status of logical theorems can be read off their proposed empty-base explanations, whereby this proposal also satisfies the first desideratum. Moreover, the special status of being empty-base explained itself can be read off the proposed empty-base explanations: According to the proposal, logical theorems do not only logically follow from the empty set of premises, but

167 See also footnote 168.

they are also explained by this empty set of reasons. Lastly, the alternative-logics desideratum can be satisfied by empty-base explanations in general, because such explanations can provide their reasons for logical theorems (i.e. none) even if we assume that, say, $P \vee \neg P$ can be true without either disjunct being true.

So, logical theorems seem to be suitable candidates for empty-base explainability, but given what we have said before, not for zero-groundability. Thus, our question is whether we can find an alternative explanatory relation that provides us with an empty-base explanation of logical theorems. Here, the most salient idea is perhaps to look again at the proposal that logical theorems can be explained by propositions that express their having a certain status. Indeed, as I have argued in chapter 3, proposals for explanation by status can be understood as empty-base explanations in which the status proposition plays the role of an explanatory link (rather than ground) that can explain the corresponding explanandum on its own, without requiring help from anything in the explanatory base.

This is the plan for the remainder of the chapter: In the next section, I try to characterize an explanatory relation on the basis of Yablo's (2014) thoughts about *reductive truthmaking* that allows for a corresponding empty-base explanation of logical theorems. As will become clearer later, most of what I am going to say can alternatively be understood as realizing the third option above (i.e. revising the logic of ground) by conceiving of the newly characterized explanatory notion as a special case of grounding. Then, in section 4.5, I will turn to the idea of (non-grounding-involving) explanation by essential or law-like status. The two sections can be read independently of each other.

4.4 Explanation by reductive truthmakers

Yablo (2014, ch. 4) distinguishes two conceptions of truthmakers: the recursive conception and the reductive conception. Here, recursive truthmaking approximately corresponds to our notion of grounding. In particular, disjunctions like $P \vee \neg P$ are recursively made true by the fact that corresponds to its true disjunct. As an alternative to recursive truthmaking, Yablo proposes a notion of reductive truthmaking. Here he is motivated by intuitions like the following:

> A disjunction is true [. . .] because of a fact that verifies one disjunct, or a fact that verifies the other. This does not seem to exhaust the options. Why not a fact that ensures that one disjunct or the other is true, without taking sides? (Yablo 2014, 60)
>
> Consider next a conditional $P \wedge Q \rightarrow P \wedge Q \wedge R$. It owes its truth, on the recursive conception, either to a fact that falsifies P, or a fact that falsifies Q, or a fact that verifies $P \wedge Q \wedge R$. Why not a fact [like the fact that R] that blocks the *combination* of $P \wedge Q$ true, $P \wedge Q \wedge R$ false, without pronouncing on the components taken separately? (Yablo 2014, 60)

To capture these intuitions, Yablo (2014, 61) proposes the following notion of reductive truthmakers, defined via his notion of a minimal model.[168]

(Minimal model)
m is a minimal model of ϕ iff$_{\text{def.}}$ m is a partial valuation of the language of ϕ that verifies ϕ and no proper subvaluation of m verifies ϕ.

(Reductive truthmakers)
ϕ's reductive truthmakers (falsemakers) are its minimal models (countermodels), or the associated facts.

This idea needs some amendment and explication: First, the definition of a minimal model has to be fixed: According to Yablo (2014, 61) the formula $P \rightarrow (P \wedge Q)$ has as a minimal model the partial valuation that assigns truth to Q. But it is not clear how such a valuation verifies $P \rightarrow (P \wedge Q)$, since the truth-conditions for this formula require P to be false or $P \wedge Q$ to be true. But the truth-conditions for these in turn are not satisfied in the proposed model. This problem can be solved by adopting the following definitions:

(Minimal model*)
m is a minimal model of ϕ iff$_{\text{def.}}$ m is a partial valuation of the language of ϕ such that all its *supplementations* verify ϕ and no proper subvaluation of m is such that all *its* supplementations verify ϕ.

(Supplementation)
A supplementation m^* of a partial valuation m of a language is a (full) valuation of the language such that m is a subvaluation of m^*.

Second, we need to clarify what the facts that are associated with a minimal model are. Here, we only look at a propositional language, so a minimal model

168 An interesting alternative option to treat Yablo's cases would be to determine how Fine's truthmaker semantics would have to be revised to capture these cases. It probably is possible to capture the first case by allowing certain additional truthmakers for disjunctions. Consider for example the disjunction $(P \wedge Q) \vee (\neg P \wedge Q)$. For this particular case, the additional truthmakers of $(P \wedge Q) \vee (\neg P \wedge Q)$ would be the truthmakers of Q, and these are part of the truthmakers of both disjuncts. Interestingly, the second case seems to differ from the first in this respect: If we conceive of the conditional as the disjunction $\neg(P \wedge Q) \vee (P \wedge Q \wedge R)$, we can see that the truthmakers of R that would have to be added to capture Yablo's idea need not be part of the truthmakers of the first disjunct. Additionally, as mentioned in section 4.3, a rationale would have to be found why this does not leave the original propositions defined by Fine without satisfactory explanations.

(viz. partial valuation of the language) is a partial truth-value assignment to atomic formulae. I will further assume that every atomic formula ϕ expresses exactly one state of affairs, and I shall say that such a state of affairs *obtains according to a model* iff the model assigns truth to ϕ. We can then stipulate that the facts that are associated with a minimal model are the states of affairs that (1) obtain according to the model, and (2) that do in fact obtain.[169] An analogous definition can be given for falsemakers and countermodels.

Furthermore, we will use Yablo's convention to refer to states of affairs and facts: p is the state of affairs or fact associated with the formula P and $\bar{p}$ is the state of affairs or fact associated with the formula $\neg P$. Yablo further refers to models by the set of simple states of affairs that obtain according to the model. For example, a model that only assigns truth to P can be referred to using '$\{p\}$'.[170]

Third, Yablo sometimes talks as if all the minimal models of a formula themselves are the truthmakers of that formula. Alternatively, we can give a corresponding (perhaps more perspicuous) definition, according to which the states of affairs that obtain according to a minimal model are the reductive truthmakers:

(Reductive truthmakers$_{NF}$)
ϕ is *reductively made true*$_{NF}$ by states of affairs Γ, iff there is a minimal model m of ϕ such that the Γ are the states of affairs that obtain according to m.

This notion of reductive truthmaking is non-factive: it defines a relation between states of affairs and formulae irrespective of whether or not the states of affairs obtain or the formulae are true. In addition to this non-factive notion, we need a factive notion of reductive truthmaking: According to an intuitive understanding of 'making true', only facts can make anything true. For example, $P \rightarrow (P \wedge Q)$ has both $\{\bar{p}\}$ and $\{q\}$ as minimal models, but of course it might be true without either Q being true (namely if $\neg P$ is true) or $\neg P$ being true (namely if Q is true). While both minimal models contain reductive truthmakers in the non-factive sense, we also want a notion to express what *actually* makes the formula in question true. Moreover, the explanatory relation that we want to define using reductive truthmaking, and the notion of 'because' are factive: If Q is not even true, it surely cannot explain why

169 If we want to assume that facts are distinct from states of affairs that obtain, then we can say that the facts that are associated with a minimal model are the facts that correspond to the states of affairs that obtain according to the model, and that do in fact obtain.

170 Note that we could alternatively omit reference to truth from the definition of a model and let the model assign states of affairs and specify whether they obtain according to the model or not.

$P \rightarrow (P \wedge Q)$. Therefore, we define a factive notion of reductive truthmaking (to be used in the following unless stated otherwise) like this:

(Reductive truthmakers$_F$)
ϕ is *reductively made true*$_F$ by facts Γ, iff there is a minimal model m of ϕ such that the Γ are the facts associated with m.

So far, we have followed Yablo in defining a notion of truthmaking for *formulae* or *sentences*. To obtain a corresponding notion for *propositions*, we assume that a proposition P is associated with a minimal model m iff there is a sentence S that expresses P and m is a minimal model of S, as defined above. Accordingly, we define that P is reductively made true by states of affairs Γ, iff there is a sentence S that expresses P and S is reductively made true by the states of affairs Γ.

With respect to Yablo's motivating examples, the above definitions yield the following results:

- $(P \wedge Q) \vee (P \wedge \neg Q)$ has $\{p\}$ as a minimal model. If p obtains, then $(P \wedge Q) \vee (P \wedge \neg Q)$ is reductively made true by p.
- One of the minimal models of $P \wedge Q \rightarrow P \wedge Q \wedge R$ is $\{r\}$. If r obtains, then $P \wedge Q \rightarrow P \wedge Q \wedge R$ is reductively made true by r.

We can now look at what the proposal says about logical theorems, for example $P \vee \neg P$:

- $P \vee \neg P$ has {} as a minimal model. This holds for every logical theorem.

Here, '{}' refers to the empty model which makes no truth-value assignment. Above we said that the reductive truthmakers of a proposition are the facts that are associated with its minimal models. We can correspondingly say that for a proposition P and a minimal model m of P, P is reductively made true by the facts that are associated with its minimal model m. Consequently, since no facts are associated with the empty minimal model {}, logical theorems such as $P \vee \neg P$ are reductively made true by zero facts, i.e. the empty plurality of facts.

We have now already arrived at a situation and instance of reductive truthmaking that is clearly reminiscent of zero-grounding – namely reductive truthmaking by zero facts. Some more work needs to be done to arrive at a corresponding kind of empty-base explanation of logical theorems. We do this as follows:

First, we assume that for every state of affairs that obtains according to a minimal model, there is a corresponding proposition that has this state of affairs and no other as a (non-factive) reductive truthmaker, and we say that such a proposition *expresses* its (non-factive) reductive truthmaker. We then define explanation by reductive truthmaking:

(Explanation by reductive truthmaking)
For every true proposition P with associated minimal model m, propositions Γ explain P by reductive truthmaking iff the Γ express the reductive truthmakers associated with m, and P does not itself express one of its reductive truthmakers.

For the limiting case in which P is made true by zero facts, we can then say that the empty plurality Γ 'expresses' the reductive truthmakers of P, i.e. none. Now since P is made true by zero facts, there is no reductive truthmaker of P that P could express, thus we can say that P is explained (via reductive truthmaking) by the propositions Γ, viz. zero propositions. Under the assumption that explanation via reductive truthmaking so construed corresponds to because-claims, we can state this more succinctly in terms of 'because': P is empty-base explained and P holds just because.

Now, the proposal yields the following because-claims:

– $(P \wedge Q) \vee (P \wedge \neg Q)$ because P, if P is true.[171]
– $P \vee \neg P$ just because.[172]

$P \vee \neg P$ and logical theorems in general can be empty-base-explained in this fashion because they are reductively made true by zero facts. As explained in section 4.3, we can use 'just because' to express empty-base-explanations, so for every logical theorem ϕ, we obtain the result that ϕ just because.

At this point, one might perhaps worry whether what we have characterized so far is really an *explanatory* relation that underwrites because-claims and affords explanations why. Note at the outset that it is not quite clear what would constitute a satisfactory response to this worry. I will simply provide some considerations in support of our relation being explanatory.

First, let us see whether the relation satisfies some formal features that explanatory relations are often assumed to possess: The relation satisfies irreflexivity because of the requirement that a proposition P can only be explained (via reductive truthmaking) by the propositions Γ that express the reductive truthmakers corresponding to a minimal model m of P, if P does not itself express one of its reductive truthmakers. The relation satisfies asymmetry for similar reasons: Suppose P explains Q by reductive truthmaking. Then P expresses a reductive truthmaker of Q, say p. According to our assumptions, for Q to in turn explain P by reductive truthmaking, Q must express a reductive truthmaker of P, say q. But

171 Note that $(P \wedge Q) \vee (P \wedge \neg Q)$ is partially grounded in P, if P is true. Therefore, the ordinary grounding account already allows that $(P \wedge Q) \vee (P \wedge \neg Q)$ partially because P. The present proposal on the other hand allows that $(P \wedge Q) \vee (P \wedge \neg Q)$ (fully) because P.
172 Or, alternatively, '$P \vee \neg P$ because $\varnothing$'.

by our definition of what it is to express a reductive truthmaker, P has just the single reductive truthmaker that it expresses, so $p = q$. But then Q expresses p, which is its own reductive truthmaker, so according to (Explanation by reductive truthmaking), if P explains Q by reductive truthmaking, then Q does not explain P by reductive truthmaking.

The requirement of transitivity is satisfied because the explanatory structure that results from the proposal is somewhat flat: Propositions corresponding to complex logical formulae are directly explained by propositions corresponding to atomic formulae (or their negations), and in the case of logical theorems, they are empty-base explained. Thus, the situation does not arise in which, for example, an atomic formula P explains a complex logical formula Q, which in turn explains a further complex logical formula R, such that the question could arise whether P explains R.[173] While this can cover the logical cases we are considering here, it is in general a question for further investigation whether and if so, how the proposal extends to non-logical cases.

A third, broadly formal feature that explanatory relations are sometimes argued to have is what Yablo (2014, 47f.) calls proportionality. But, as Yablo shows, this observation may even identify a particular strength of the reductive truthmaking proposal, since reductive truthmakers seem to have an especially good claim to proportionality compared to ordinary grounds:

> Truthmakers, like causes, should not be overladen with extra detail. [. . .] [Truthmakers] should [. . .] not incorporate irrelevant extras, in whose absence we'd still have a guarantee of truth. (Yablo 2014, 48)

There thus appears to be a kind of explanatory relevance that is captured by the new notion that is not captured by grounding.

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173 One might wonder if the flatness of the explanatory structure is not implausible. For instance, given that P fully explains $(P \wedge Q) \vee (P \wedge \neg Q)$, one might think that also $P \vee \neg P$ fully explains $((P \vee \neg P) \wedge Q) \vee ((P \vee \neg P) \wedge \neg Q)$. But as it stands, the proposal does not deliver this result. As a reviewer for the paper on which this chapter is based has pointed out, the present approach also has trouble handling the generalization to infinitary non-modal propositional logic, for it relies on the assumption that any formula with models has minimal models (i.e. minimal partial valuations): Consider a countably infinite set S of semantically independent atomic formulas $\{P_0, P_1, P_2, \ldots\}$ and a formula *INF* that in effect says that S has infinitely many true members, e.g. an infinite disjunction of infinite conjunctions of each infinite subset of S. Then *INF* has models but no minimal models, since any model of *INF* can be reduced by dropping its assignment of a truth-value to one member of S. I leave to future research the questions of how forceful these objections are, and whether the proposal can be amended in such a way as to meet them.

Finally, our proposal captures intuitively appropriate explanatory proposals that otherwise would remain uncaptured; we should not forget that with respect to logical theorems, the proposal from reductive truthmaking is supposed to deliver the desired alternatives to grounding explanations. So, let us make explicit how explanation by reductive truthmaking indeed provides more satisfactory explanations of logical theorems than grounding explanation. As we have seen, it is not completely straightforward to spell out how in what respect the ordinary grounding explanations seem to be lacking. Yet, explanation by reductive truthmaking provides logical theorems with empty-base explanations with all their special explanatory features that have been mentioned above.

Here, recall once more the four desiderata for explanations of logical theorems identified in section 4.2: accounting for the status as necessary truths or logical theorems, modal stability, not giving rise to further (or just very few or not very pressing) why-questions, and compatibility with certain non-standard logics. Satisfaction of the first desideratum might be witnessed by the following reasoning: According to the proposal, logical theorems are explained in the empty set of facts. Necessarily, all facts in this set obtain. Under the assumption that explanation by reductive truthmaking transmits necessity, the necessity of logical theorems follows. Likewise, the explanation is modally stable: Whatever may be the case, logical theorems can be explained in the empty set of facts. Like every empty-base explanation, the explanatory proposal at hand does not involve reasons why its explanandum obtains and hence does not give rise to corresponding demands for further explanations. The empty-base proposal is moreover (given small adjustments) compatible with at least some logical settings in which $P \vee \neg P$ can be true without either of its disjuncts being true: In such a case, an ordinary grounding explanation is unavailable, but $P \vee \neg P$ can still be empty-base explained by reductive truthmaking. For example, in a supervaluationist setting, we can define minimal models as follows:

(Minimal model$^*_{SV}$)
m is a minimal model of ϕ iff$_{\text{def.}}$ m is a partial *super*valuation of the language of ϕ such that all its *supplementations* verify ϕ and no proper sub*super*valuation of m is such that all *its* supplementations verify ϕ.

(Supplementation$_{SV}$)
A supplementation m^* of a partial *super*valuation m of a language is a (full) *super*valuation of the language such that m is a sub*super*valuation of m^*.

Here, a (full) *super*valuation is a set of (full) classical valuations and a partial *super*valuation is a set of partial classical valuations. Moreover, we define that m

is a sub*super*valuation of m^* iff every classical valuation in m is a subvaluation of a classical valuation in m^*. According to these definitions, $P \vee \neg P$ has an empty minimal model. In the supervaluationist setting, $P \vee \neg P$ can be (super-) true without either P or $\neg P$ being (super-)true. Because it has an empty minimal model, $P \vee \neg P$ is (reductively) made true be zero facts in this case as well.

Given these considerations, explanation by reductive truthmaking appears to be promising with respect to our goal of finding more satisfactory explanations of logical theorems. While I am inclined to treat the developed notion as distinct from grounding, we could (as mentioned in section 4.3) alternatively conceive of it as a special case of grounding and revise the logic of ground accordingly such that, for instance, a disjunction may be grounded via its disjuncts, or it may be grounded in propositions that express its reductive truthmakers.[174]

To conclude my discussion of the empty-base explanation of logical theorems via reductive truthmaking, let me anticipate one objection: According to the proposal, some explanatory claims arise that, in a certain light, may seem problematic: For example, suppose that $\neg P$ and Q are the case. Then, according to the above proposal, it is the case that (1) Q explains why $P \rightarrow (P \wedge Q)$ and (2) that Q explains why $\neg P \vee (P \wedge Q)$ (and analogously for the corresponding because-claims). This can appear intuitively problematic: It can seem that in some sense for Q to explain why, e.g., $\neg P \vee (P \wedge Q)$, Q has to *ensure* that $\neg P \vee (P \wedge Q)$ is being the case. But one may wonder how Q can achieve this, if not together with P. Yet, as stipulated, P is not the case and thus Q cannot ensure that $\neg P \vee (P \wedge Q)$ is the case.[175]

I propose to respond to this worry by taking a closer look at the notion of ensurance involved in the objection: Apparently, it is closely tied up with grounding, or perhaps it is indeed the notion of grounding. But then the objection appears to miss its mark: Presently, we are trying to find and characterize a different kind of explanatory relation that is distinct from grounding and hence must not assess the explanatory proposals it occurs in in the same way in which we assess grounding explanations. In response to the objection, we can then claim that the intuitive doubts arise because of an assessment of the explanatory proposals as grounding explanations, while in fact they are a different kind of explanation that does not involve grounding.

For this defense to be successful, we should be able to show that the explanatory proposals in question need not appear to be intuitively dubious. Here, talk of ensurance can actually help: While there is a sense of 'ensurance' in which the

174 As mentioned in footnote 164, one rule that would have to be changed is the elimination rule for disjunction.

175 An analogous problem arises for Yablo's example $P \wedge Q \rightarrow P \wedge Q \wedge R$.

above ensurance-claims hold, there surely is another (not merely modal) sense in which Q alone *does* ensure that $\neg P \vee (P \wedge Q)$: After all, given Q, whether P or $\neg P$ turns out to be the case can appear, in a sense, irrelevant to whether $\neg P \vee (P \wedge Q)$ obtains or not – Q alone already does the job. From this point of view, the intuitive doubts should dissolve. Here, recall also Yablo from above:

> Consider next a conditional $P \wedge Q \rightarrow P \wedge Q \wedge R$. It owes its truth, on the recursive conception, either to a fact that falsifies P, or a fact that falsifies Q, or a fact that verifies $P \wedge Q \wedge R$. Why not a fact that blocks the *combination* of $P \wedge Q$ true, $P \wedge Q \wedge R$ false, without pronouncing on the components taken separately? (Yablo 2014, 60)

The rhetorical question here invokes the intuition that there is indeed a sense of making true (or ensuring the truth) according to which a fact r (corresponding to R) makes true (ensures the truth of) $P \wedge Q \rightarrow P \wedge Q \wedge R$, even if $P \wedge Q$ is false. This is the sense we set out to capture above.

4.5 Explanation by essence and metaphysical law

The purpose of this section is to gain a better understanding of explanation by essence and metaphysical law and to see whether explaining logical theorems by their essential or metaphysically law-like status is viable. As we have seen in the previous chapter, explanatory proposals of the form 'P because it is part of the essence of . . . that P' and 'P because it is a law of metaphysics that P' face several worries, although they are not without proponents, such as Glazier (2017b), who proposes that they are not grounding explanations but a distinct kind of 'essentialist explanation'. In this section I will explore another option, namely that explanations by essential status are at least sometimes to be understood as empty-base explanations whose link is a proposition that expresses the essential status of the explanandum (or a closely related proposition, see the relevant discussion on the form of links of empty-base explanations in chapter 2 and chapter 3). To begin, consider the following two proposals for the explanation of logical theorems:

(Metaphysical law)
It is a metaphysical law that $P \vee \neg P$. Metaphysical laws of unconditional form can serve as links of empty-base explanations and metaphysical laws of conditional form can serve as links of ordinary explanations.

(Essential conditionals)
It is some kind of essential fact that $P \vee \neg P$. Essential facts of unconditional form can serve as links of empty-base explanations and essential facts of conditional form can serve as links of ordinary explanations.[176]

Using '■' as a placeholder for the essence or metaphysical law operator again, these proposals amount to ordinary explanations of the following form:

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

Empty-base explanations of logical theorems would have the following form according to the two proposals:

Base: /
Link: $\blacksquare(P \vee \neg P)$
Result: $P \vee \neg P$

The next step in the development of this proposal is to provide a characterization of the corresponding explanatory relation (involving essence or metaphysical laws) that meets the following desiderata:

For the case of metaphysical laws, an account is needed according to which they are sufficiently distinct from grounding – namely such that there are explanations involving metaphysical laws as links that do not correspond to grounding explanations, otherwise the metaphysical law of the form '$\blacksquare(P \vee \neg P)$' would threaten to have a corresponding zero-grounding fact, which is the very thing that we set out to avoid. As far as I know, an account of this type of metaphysical law has not yet been given. One could attempt to characterize these laws negatively as those metaphysical laws which are not grounding laws, but this would at least require a sufficiently informative account of metaphysical laws. In what follows, I will instead focus on the notion of essence.

For the case of essence, one might think that certain essential conditionals can play the role of explanatory links, but this proposal would have to be properly developed; additionally, just as with metaphysical laws, the resulting explanatory notion would have to be sufficiently distinct from grounding. For example, Kment (2014, 164) can be understood as claiming that for every explanation *e* with a

176 Again, if links of empty-base explanations are to have a slightly different form, namely that of a conditional with an empty antecedent, make the relevant substitutions here.

metaphysical law or essential conditional as link, there is a corresponding grounding fact that holds between the elements of the base and the result of *e*. Given this assumption, it would be plausible that a metaphysical law or essential truth of the form '$\blacksquare(P \vee \neg P)$' possesses a corresponding zero-grounding statement.[177]

Here, one could also reason as follows: At least some essence conditionals appear to correspond to grounding facts. For example, consider the essence of the fact $[P \vee \neg P]$ or the alethic essence which we can express using the operator '$\Box_{P \vee \neg P}$'.[178] One might now think that it is part of at least one of these essences that if P, then $P \vee \neg P$. But these essential conditionals correspond to the non-factive grounding fact $[P \Rightarrow (P \vee \neg P)]$. If there are essential conditionals that can serve as explanatory links but do not correspond to grounding facts in this fashion, the friend of explanation by essence should give an account of what distinguishes them from grounding-corresponding essential conditionals and give an account of the kind of explanation that they allow, in contrast to grounding explanation.

Importantly, this problem of corresponding grounding claims only arises if we want to find an explanatory notion that is truly distinct from grounding. If we on the other hand aim to characterize a range of special, extraordinary cases of (zero-)grounding, no such problem arises.

A further desideratum concerns the question of whether a kind of essence conditional can be found that is structurally adequate to serve as explanatory links. We may for example identify a certain kind of essential conditional as an explanatory link, but then this conditional might still fail to exhibit the structural features of explanatory links. For instance, it is presumably true for any proposition $[P]$ that it is part of the essence of $[P]$ that $P \rightarrow P$, i.e. $\Box_{[P]}(P \rightarrow P)$.[179] But if so, the essential conditional expressed by '$\Box_{[P]}(\ldots \rightarrow \ldots)$' is reflexive. This specific problem seems fixable by treating this essential conditional as a weak 'explanatory' notion which can be used to define a strict explanatory notion (in analogy to weak and strict ground, see Fine 2012).[180]

But in general it is not clear that essential conditionals will play nice and exhibit the structural features of explanatory links: For example, there might be

177 Some discussion on principles connecting grounding and essence is available in the literature, see for example Correia (2013b) and Correia and Skiles (2019), but note that it is at least not obvious that these proposals indeed lead to the problem just described.

178 For the notion of alethic essence see Correia (2013b).

179 For simplicity's sake this example uses individual essence, but other notions of essence can be considered as well.

180 A further option might be to invoke the distinction between constitutive and consequential essence, thanks to Jonas Werner here.

cases of symmetric essential dependence, e.g. a case of *a* and *b* such that first it is part of the essence of *a* that if *b* exists, then so does *a*, and second it is part of the essence of *b* that if *a* exists, then so does *b*. If there are such cases and all essential conditionals are explanatory links, it follows that the existence of *a* explains the existence of *b* and vice versa, violating the asymmetry of explanation.[181]

Let us now consider how these challenges could be met: First, given the unclear epistemology of essence, the widely varying theories about essential properties of things there are, and given that our intuitions concerning many essential claims are (if they exist at all) often weak or easily turned over, it is difficult to justifiably maintain strong opinions about essential facts. The issue is exacerbated by the variety of notions of essence – for example, for a given intuition about essence the question arises whether it should be cashed out as a claim concerning the individual essence (e.g. of a property) or as a generic essential claim.[182] For our proposal, this predicament is both boon and bane. Bane, because we cannot sufficiently rely on our intuitions to simply check whether essential conditionals satisfy the formal properties of explanatory links. Boon, because it may allow us to treat the formal properties of explanatory links as a constraint on essential conditionals – at least to some extent. Finally, if it should nevertheless turn out that essential conditionals do not, so to speak, cooperate – or as long as we do not know whether they do – we might still be able to use them to hint at a related explanatory notion, just like we might do in the case of grounding. I will now sketch a way in which this might be done which relies on two ideas: First, essential conditionals are differently 'localized'. Second, differently localized essential conditionals correspond to different explanatory notions.

In what follows, I suggest that we can take some steps towards satisfying the desiderata by differentiating essential conditionals that are differently 'essentially localized', in a sense to be clarified momentarily. The basic idea is this: Essential conditionals that correspond to grounding claims are localized in the essences of the corresponding groundees (we might call these *downwards essential conditionals*), but there may also be essential conditionals that are differently localized (e.g. *upwards essential conditionals*), that can serve as explanatory links of metaphysical explanations distinct from grounding (or at least serve to characterize such a notion).

It has been argued in the literature that there exists a close connection between essence and ground: While the details differ, it has emerged that in some sense, grounding facts correspond to facts that are essential to the corresponding

181 One way one could attempt to solve this specific problem is by claiming that the two essential conditionals are instances of different explanatory relations (one corresponding to the essence of *a* and the other corresponding to the essence of *b*) that are not in harmony.
182 For the distinction between individual and generic essence see Correia (2006).

groundee (or perhaps some of its constituents).[183] Thus, variants of the following simple link between ground and essence are proposed:

E1: For all Γ, p: $\big((\Gamma < p) \rightarrow \Box_{[p]}(\Gamma \rightarrow p)\big)$

Here, the essence in question is the essence of the grounded fact, viz. the groundee. Variations on this idea could adduce the essence of a constituent of the groundee or the alethic essence of the groundee. As an example of an instance of the above principle, consider the grounding claim that the existence of Socrates grounds the existence of singleton Socrates. At least if we take this grounding claim for granted, it is quite plausible to assume that it is part of the essence of the proposition or fact that singleton Socrates exists that if Socrates exists, then singleton Socrates does exist as well. Similar and likewise plausible essences can be found if the proposals involve essences of constituents of the groundee or the groundee's alethic essence.

We might say that grounding claims give rise to corresponding essential conditionals which are 'localized' in or 'flow from' their groundees – meaning that it is part of the essence of the groundee (or constituents of the groundee) that the corresponding conditional obtains. Now the idea that I want to develop here is that we might be able to characterize other metaphysical explanatory relations by what essential conditionals they entail and how they are localized. Something stronger may be possible, namely that the different essential conditionals themselves are explanatory links, but note that even something weaker may do: To characterize an explanatory notion it may also already be sufficient (or at least useful) to know that corresponding explanatory links *normally*, *often*, or even just in special cases give rise to certain essential facts.[184]

For example, the essential conditional entailed by such an explanatory relation might belong to the essence of the base-relatum or some of its constituents (let '$<_*$' stand for the explanatory notion that is to be characterized):

E2: For all Γ, p: $\big((\Gamma <_* p) \rightarrow \Box_{[\Gamma]}(\Gamma \rightarrow p)\big)$

Here, it is harder to give clear examples, but we can look at the case of colors and their determinates (which incidentally could be troublesome for E1): Consider the case of an object a's being scarlet and its being red. The object's being scarlet

183 For proposals like this and discussion thereof see e.g. Fine (2012, 74ff.), Correia (2013b), Correia and Skiles (2019), and Goff (2017, sec. 2.2.2).

184 With 'characterization' I do not mean definition but rather a weaker notion of elucidation along the lines of hinting at, describing and explicating the notion such as to allow for a decent grasp of it.

metaphysically explains its being red, and ordinarily, this is taken to be a grounding explanation. But, as Fine (2012, 74ff.) in effect points out, there is some doubt that the essence obtains that is required if we assume a grounding-essence link like E1. According to E1, it would have to be part of the essence of the fact that the object is red, that if the object is scarlet, then it is red. But, using Fine's (2012, 75) idiom, that fact's (or alternatively redness's) essence does not 'know anything about scarlet'.[185] Nevertheless, it is plausible to assume that there is an essence that underlies the metaphysical explanatory relation at play here, namely the essence of being scarlet or the fact that the object a is scarlet. According to this proposal, it is part of the essence of the fact that the object a is scarlet that if the object is scarlet, then it is red.

To give a final option for a link between a metaphysical explanatory notion and essence, we could consider the collective essence of the base- and result-relata or their constituents (let '$<_{**}$' stand for the explanatory notion to be characterized):

E3: For all Γ, p: $\big((\Gamma <_{**} p) \rightarrow \Box_{[\Gamma, p]}(\Gamma \rightarrow p)\big)$

Again, considerations concerning color can be used to motivate this idea: As I have argued elsewhere (Kappes 2020b), we can maintain the idea that the essence of, for example, greenness does not mention blueness and yellowness, and at the same time assume that the three colors are essentially linked, namely by using the notion of collective essence. Given this idea, it is plausible to assume that is part of the collective essence of blueness, yellowness, and greenness that if something is the color of a subtractive mixture of blue and yellow, then it is green. But this essential conditional seems to correspond to an explanation of the thing's being green in terms of it having the color of a subtractive mixture of blue and yellow. Moreover, a variant of this idea might serve as a further example for upwards essence à la E2: Perhaps it is not the collective essence of blueness, yellowness, and greenness in which the relevant conditional is located, but it is rather part of the collective essence of blueness, yellowness, and subtractive color mixing that if something is the color of a subtractive mixture of blue and yellow, then it is green.

There are several further options that may come to mind: For example, the relevant conditionals might belong to the essence of constituents of base- or result-relatum, they might belong to the essence of facts in general or being the

185 For responses to this that defend something like E1 see Correia (2013b) and Correia and Skiles (2019).

case in general, and another candidate is perhaps the essence of the explanatory notion to be elucidated (although this would perhaps threaten the elucidatory potential of the connection between essence and the explanatory notion that we are trying to get at).

The existence of explanatory relations characterized by E2 or E3 would have significant upshots for topics beyond the explanation of logical theorems. For example, take the following example from the philosophy of mind: According to a number of authors, phenomenal introspection provides us with some grasp of the essence of the relevant phenomenal properties. According to some (e.g. Goff 2017), this 'revelation' of essential properties of consciousness amounts to a challenge for physicalism and the metaphysical explanation of the mental in terms of the underlying physical reality. In a nutshell, Goff argues for a strong form of revelation according to which so much of the essence of phenomenal consciousness is revealed that were it grounded in underlying physical properties (or even Russellian (proto-)phenomenal for that matter), and given a suitable grounding-essence link, we would be able to discern these grounds in introspection. But since we are not able to do so, phenomenal consciousness is not so grounded.

Here, an explanatory relation characterized by E2 could in principle afford an alternative kind of metaphysical explanation of phenomenal consciousness in terms of some underlying physical (or Russellian (proto-)phenomenal) reality that is compatible with both a strong principle of revelation and what we actually learn from introspection: In this case we would not have to learn about essential conditionals' connection to the underlying reality to facts about our phenomenal states through introspection. Rather, the relevant kind of metaphysical explanation would correspond to essential conditionals that flow from the essence of the underlying reality (rather than the essence of the explanandum constituted by our phenomenal states). For example, a physicalist could claim that it is part of the essence of certain fundamental physical entities, properties or processes that if they are present, then certain phenomenal states will be present. Likewise, a Russellian monist or panpsychist could claim that it is part of the essence of certain fundamental (proto-)phenomenal properties that if they are present, then certain of our ordinary phenomenal states will be present. Thereby they could even maintain their hope of being (in principle) able to close the explanatory gap: If we could only grasp the essences of the (proto-)phenomenal fundamental properties, we would understand how they give rise to our ordinary phenomenal states.

4.5.1 Considering downwards essence

Let us now come back to our original topic and consider how the above ideas may be applied to the topic of explaining logical theorems. Let us first think about whether the essences of the relevant logical operators or the essence of the relevant explananda can help characterize the explanatory notion that we are after. We will consider [$P \vee \neg P$] as an example and ask part of which essence this fact plausibly is. Note first that it is somewhat intuitively plausible that [$P \vee \neg P$] is indeed part of some essence or other and that if all necessary truths (i.e. truths expressed by sentences with a $\Box$-operator in front) are grounded in (or otherwise depend on) essential truths as Fine (1994) proposes, then there arguably has to be an essence part of which is the fact [$P \vee \neg P$].[186] So, let us make this assumption and consider the following options:

1. It is part of the essence of the relevant logical operators (in our case presumably negation and disjunction) that $P \vee \neg P$.
2. It is part of the essence of the proposition or fact [$P \vee \neg P$] that $P \vee \neg P$.
3. It is part of the alethic essence of [$P \vee \neg P$] that $P \vee \neg P$.

If explanatory links of empty-base explanations can have an unconditional form like 1., 2., and 3., then these might be candidates for explanatory links of an empty-base explanation of [$P \vee \neg P$], or they might serve to characterize such links. But recall the discussion of the conditional form of explanatory links in chapters 2 and 3: If the links of empty-base explanations have a conditional form with an empty antecedent, then we must consider other candidates for our desired explanatory links or their characterization (again, 'Γ' stands for the empty plurality of facts):

1. It is part of the essence of the relevant logical operators (in our case presumably negation and disjunction) that $\Gamma \rightarrow (P \vee \neg P)$.
2. It is part of the essence of the proposition or fact [$P \vee \neg P$] that $\Gamma \rightarrow (P \vee \neg P)$.
3. It is part of the alethic essence of [$P \vee \neg P$] that $\Gamma \rightarrow (P \vee \neg P)$.

Let us comment on these proposals in turn: Concerning 1. and 4. we can observe that essential conditionals that concern the essence of logical operators arguably cannot (in general) serve as links of explanatory theorems, because they violate asymmetry: For example, it is plausibly part of the essence of conjunction that if

186 In fact, matters may be less straightforward. [$\Box(P \vee \neg P)$] could perhaps be zero-grounded in the empty set of essences. Or it could be grounded in other essential facts – but which would these be?

P and Q, then $P \wedge Q$. But then equally, it seems that it is part of the essence of conjunction that if $P \wedge Q$, then P and Q. Furthermore, it is unclear how the idea of hinting at a corresponding explanatory relation alluded to above should be spelled out in this case, but perhaps the idea might be salvaged by a complexity criterion that states that the explanatory relation in question runs from the less complex to the more complex formulae.[187]

Concerning 5., the following problem arises: Suppose we assume that $[P \vee \neg P]$ is not zero-grounded and we assume the converse of the grounding-essence link E1 (substituting non-factive grounding for factive grounding in the consequent):

E1*: For all Γ, p: $\left(\Box_{[p]}(\Gamma \rightarrow p) \rightarrow (\Gamma \Rightarrow p)\right)$

Then it follows that it is not part of the essence of $[P \vee \neg P]$ that $\Gamma \rightarrow (P \vee \neg P)$, where '$\Gamma$' stands for an empty plurality of facts. This is because from it being part of the essence of $[P \vee \neg P]$ that $\Gamma \rightarrow (P \vee \neg P)$, and principle E1* it would follow that $[P \vee \neg P]$ is non-factively zero-grounded (and hence factively as well). Therefore, if we make the above plausible assumptions about the relationship between essence and grounding, the fact that it is part of the essence of $[P \vee \neg P]$ that $\Gamma \rightarrow (P \vee \neg P)$ (that is fact 5.) cannot be the explanatory link (or help characterize the explanatory link) of a non-grounding empty-base explanation of $[P \vee \neg P]$.

While this argument does not go through like this for the remaining options 2., 3., and 6., I suspect that plausible alternatives to the grounding-essence links E1 and E1* can be found such that corresponding arguments can be formulated. In any case, the proposals are all uncomfortably close to the fifth proposal which is confronted with the problem that I have just laid out: All formulate essential claims that, given plausible assumptions about the relation between grounding and essence, either entail that $[P \vee \neg P]$ is zero-grounded (which we wanted to avoid), or come close to such essential claims.

4.5.2 Considering upwards essence and other localizations

So, what about the other options? Above I suggested the idea that an explanatory connection can, as happens in the case of grounding, be 'localized in' or 'flow from' the essence of the explanandum (or something involved therein). This idea was exemplified by E1. Alternatively, other explanatory connections might be thought to flow from the essence of the explanans (or something involved therein), or even

187 Thanks to Jonas Werner here.

from some other essence that we have not considered yet. So perhaps the essence of facts in general or being the case in general (as quickly mentioned above), or perhaps the essence of the proposition [P] could be candidates here, but I rather want to address the idea that the explanatory connection can flow from the essence of the explanans, as exemplified by E2.

Now for our case, if we want to stick with the idea that logical theorems are empty-base explained, the idea of the explanatory connection flowing from the essence of the explanans runs into an obvious problem: There are no explanans-propositions or -facts from whose essence (or from whose corresponding alethic essence) the relevant explanatory links could flow. Thus, this idea appears to be a non-starter. That is, unless we consider – well – the essence of the *empty* plurality of propositions or facts, or the alethic essence of the propositions that make up the *empty* plurality of propositions. For example, for the case of [$P \vee \neg P$], one way to spell this idea out would be the claim that it is part of the essence of the empty plurality of propositions that if the empty plurality of propositions obtains, then $P \vee \neg P$. More precisely, the claim would be: $\Box_{[\Gamma]}(\Gamma \rightarrow (P \vee \neg P))$, where '$\Gamma$' stands for the empty plurality of propositions. This essential conditional could then be used to characterize the explanatory connection between the empty plurality of propositions and [$P \vee \neg P$] as suggested above.

Are there any obvious problems for this idea? Well, setting aside the question of whether idea of the essence of the empty plurality of propositions or facts is indeed sensible, there is the worry that essences in some sense have to be relevant to what they are essences of. But why should essences involving arbitrary disjunctions of the form '$P \vee \neg P$' be relevant to the empty set of propositions? Moreover, it is natural to assume that the proposal can be generalized to a non-empty plurality [Γ], which would explain [$(\Gamma \wedge P) \vee (\Gamma \wedge \neg P)$], while the link from [$\Gamma$] to [$(\Gamma \wedge P) \vee (\Gamma \wedge \neg P)$] flows from the essence of [Γ]. But in that case, the essence of the arbitrary truths [Γ] would involve the arbitrarily chosen proposition [P] – the essence of every truth would then in some way involve every proposition, which could be considered to be somewhat in tension with the relevance idea connected to essence.

What could, on the other hand, be said in favor of this idea? Well, first, it is not obvious that the problem runs into worries regarding asymmetry. Second, it captures somewhat neatly both the idea that logical theorems are empty-base explained, but that this is not a case of grounding, and the idea that the kind of explanation in play flows from the essence of the explanans as opposed to flowing from the essence of the explanandum (that the explanation in question flows from the essence of the explanans is supposed to mean either that the essence of the explanans contains the explanatory links in question, or that it can be used to hint at those links, as sketched above). Of course, it would be nice if we could,

thirdly, claim some intuitive plausibility of the proposal (beyond its capturing the idea that logical theorems are empty-base explained), but at least my intuitions are either silent or somewhat divided on the matter.

4.6 Remaining options and conclusion

Are there any other candidates for explanatory notions that could constitute links of explanations of logical theorems besides those discussed above? To mind come perhaps some varieties of grounding that have been suggested in the literature. Here, one might think about Fine's (2012) varieties of grounding: Perhaps one could think about differentiating logical grounding as defined in Fine (2017a, 2017b) from metaphysical grounding and suggest that the ordinary grounding explanations of logical theorems concern their logical grounds, while other grounds (perhaps zero-ground) are available when metaphysical grounding is considered. Alas, one obstacle to this is that Fine's varieties of grounding have not yet been particularly well clarified.

Another suggestion would be to take a cue from a recent proposal by Jason Turner (2017), according to which we should differentiate two kinds of grounding, namely metaphysical specification and metaphysical causation. The thought would be that the ordinary grounding explanations of logical theorems involve grounding-as-metaphysical-specification, while grounding-as-metaphysical-causation can afford the more satisfactory explanations that we are looking for. So, the question is whether $[P \vee \neg P]$ (as our placeholder for logical theorems in general) might be metaphysically caused by something in addition to being metaphysically specified by its true disjunct.

Several *prima facie* issues arise to confront an affirmative answer: First, ordinary causation works together with grounding (understood as metaphysical realization) to explain disjunctions via their true disjuncts. Thus, at least in this respect, metaphysical causation would have to differ from ordinary causation. Second, something fit to metaphysically cause the disjunction would have to be found. Perhaps facts expressing the special status of the disjunction could play the role, but this potentially runs into the problems from chapter 3. So alternatively, maybe grounding-as-metaphysical causation allows for a corresponding kind of zero-ground as well? I will not attempt to answer this question, but rather use it to transition to the next chapter: *If* grounding-as-metaphysical causation allows for its own kind of zero-grounding and *if* metaphysical causation and causation share many of their features, should we admit the possibility of a phenomenon that we might dub *zero-causation* (or *causation ex nihilo*)? Approaching this latter question is part of what will occupy us in the following.

Let us end this chapter by drawing a little on what I will eventually say in the next chapter. There is an interesting connection between the idea floated at the end of section 4.5 and the idea of logical theorems being empty-base explained via metaphysical causation that I have just considered: In section 5.2.2, I will use the idea that instances of causation involve causal powers of constituents of the associated causes. This raises the question whether metaphysical causation stands in a similar relation to an analogue of causal powers. Here, a conjecture that may be worth thinking about further is the following: Analogous to causal powers for metaphysical causation are essences of the corresponding metaphysical causes (or essences of these causes). But given this conjecture, metaphysical causation starts to look like the explanatory relation that I have tried to characterize at the end of the last section, namely like a kind of explanation whose explanatory links are part of (or at least closely related to a part of) the essence of the corresponding explanatory base or sources.

5 Causation Ex Nihilo: Could There Be Empty-Base *Causal* Explanations?

This chapter investigates the following questions that naturally arise when thinking about empty-base explanation and explanatory relations that allow for corresponding empty-base explanations such as grounding:

1. Does every explanatory relation allow for a corresponding kind of empty-base explanation?
2. In particular, is *empty-base causal explanation* (or what we might call *causation ex nihilo*) possible?
3. What is it about explanatory relations that does or does not allow for empty-base explanation?

Let me be a bit more explicit about what is meant by 'empty-base causal explanation'. I have in mind a kind of explanation featuring a causal analogue of zero-grounding that we may call 'zero-causation' or 'causation ex nihilo'. The idea of zero-causation can be understood analogously to zero-grounding, given a few assumptions about causation.[188] I will assume that causation can be expressed by a sentential operator; we will use '↦' and assume that causal claims have the form 'Γ↦*P*'. Here, '*P*' stands for the effect and 'Γ' for a plurality of causes that cause the effect. Then, we can define zero-causation claims as those causal claims in which 'Γ' stands for an empty plurality of causes. Suppose on the other hand that causation can be expressed by claims of the form '*ff* cause *g*', which involve a two-place relational predicate 'cause' relating a plurality of causes to an effect, then zero-causation can be expressed either by a claim of that form where '*ff*' refers to the empty plurality of facts, or by claims of the form '*g* is zero-caused' which involve a one-place predicate 'is zero-caused' that stands to 'cause' in a relation corresponding to the relation that 'is zero-grounded' stands to 'ground'.

For the purpose of this chapter, I will assume that the idea of zero-causation can be expressed in these ways. More specifically, I will assume the first formulation to work. This is not to say that these assumptions are trivial or uncontested; rather, I am interested in what can be said for and against the possibility of zero-causation assuming the expressibility of the idea. A preliminary clarification of the idea of zero-causation is in order: Like in the case of zero-grounding, the idea of zero-causation does not amount to that of a fact that can in some way be

188 In principle that is: Of course, if it turns out that something in the concept of causation prohibits zero-causation, it cannot be properly understood.

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characterized as 'empty' causing something, or of *the nothing*, understood as some curious entity causing something – whatever exactly that may mean. More sensibly perhaps, one may think that facts like the fact that nothing (of a certain type) exists or facts according to which the amount of a certain physical quantity is zero can cause things.[189] This idea is distinct from the idea of zero-causation, which amounts to the idea of something being caused, but not being caused *by* anything. In this respect, again, the notion is analogous to the notion of zero-grounding.

The three questions above are not only interesting because answers to them would improve our understanding of the phenomenon of empty-base explanation, and because the availability of zero-causation would most likely have interesting philosophical applications, but also for the following reason: In principle, one might grant the possibility of zero-grounding explanation and other kinds of empty-base explanations like those that I discussed in the previous chapters, and still deny the possibility of other kinds of empty-base explanation such as zero-causation explanation. But, then, given that the arguments for the possibility of empty-base explanations such as zero-*grounding* explanation have to overcome some intuitive resistance, merely pointing out the counter-intuitiveness of zero-*causation* is insufficient. Rather, some sort of account is called for of the difference between the kinds of explanation that allow for empty-base explanation and those kinds of explanation that do not allow for it.

Alternatively, we could either deny the possibility of empty-base explanation in general, or we could accept the possibility of every kind of empty-base explanation including zero-causation. The former option would not exactly fit what this book is all about, and the latter option leaves us with the task of making the notion of zero-causation intelligible. It is to be expected that this issue gets more pressing the more similar one takes grounding and causation to be: If grounding were indeed a kind of causation – 'metaphysical causation' – as for example Wilson (2018) claims, it would be hard to see how zero-grounding could be possible without zero-causation being possible too.[190]

In the following I will take some steps towards answering the question whether zero-causation is possible and develop some ideas for answers to the other two questions above. In the end, the question of whether empty-base explanation by law of nature might be more tractable. In fact, as we will see below, a 'real-science' candidate (from Boltzmannian statistics to be precise) for what (in effect) amounts to an empty-base explanation of a part of concrete physical reality by statistical

189 Thanks to Jonathan Schaffer for pointing out this idea to me.

190 For a response to Wilson's view see Bernstein (2016).

law of nature (and hence a potential corresponding answer why there is anything at all) has recently been identified by Hicks and Wilson (2021). But before we look at these issues more closely in section 5.2, let us warm up with a look at Litland's argument for the zero-grounding of non-factive grounding claims that will provide this chapter and the question whether every kind of explanation allows for a corresponding kind of empty-base explanation with some additional motivation.

5.1 Generalizing Litland's argument for zero-grounding of non-factive grounding facts?

Litland (2017) argues that non-factive grounding facts are zero-grounded. In this section I try to show that Litland's argument has an interesting yet potentially problematic feature: The argument is so general that it likely applies not only to grounding, but to other explanatory notions such as laws of nature and possibly causation as well; in any case, Litland does not provide reason to believe that his argument should not so generalize. Thus, let us now look at Litland's two considerations which he uses to motivate the zero-groundedness of non-factive grounding claims. The first is the metaphor of the machine that we have already encountered in chapter 2:

> 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.
>
> In terms of this picture, why would the machine give the verdict that $\Delta \Rightarrow \phi$ is zero-grounded if true? Think of it like this. When the machine is fed no input the machine, instead of remaining idle, "simulates" the results of being fed various input. In simulating what happens when it is fed the propositions Δ the machine proceeds just as it would have if it in fact had been fed Δ as input. If, when running the simulation, the machine churns out ϕ, the machine ends the simulation and churns out $\Delta \Rightarrow \phi$. Since the machine was fed no input this means that $\Delta \Rightarrow \phi$ is zero-grounded if true. (Litland 2017, 287)

At least *prima facie*, nothing in this consideration concerns features that are specific to grounding. Thus the question arises whether the same consideration extends to arbitrary kinds of explanatory links, for example laws of nature, or – perhaps more controversially – causation. In order for the consideration to generalize to other explanatory notions, it must be possible to make sense of corresponding non-factive notions. For laws of nature, this condition is fulfilled because laws of nature are presumably non-factive in general: From its being a law that for every x, if it is F, then it is G too it does not follow that there is any x that is F or G.

The situation is different for causation and 'non-factive causal claims': Grounding (which allows for a non-factive notion) is much more modally stable than causation: First, causes often do not necessitate (with either metaphysical or natural necessity) their effects. For example, something might intervene in a nearby world that keeps the original cause from causing the effect. Second, causation seems to be an external notion in the sense that the existence in some non-actual world of something that is a cause and something that is an effect in the actual world does not guarantee that they are causally related in that other world: Again, an intervening factor might keep the original cause from causing the effect, but now a different cause may bring about the original effect. Therefore, there is some reason to doubt that causation is modally stable enough for a corresponding non-factive notion to exist.[191]

191 Cf. Kovacs (2022). Kovacs there raises the question of what causes causal claims. After having argued for the sensibility of the question, he considers several potential answers and finds them all lacking. For what it's worth, I find the following picture attractive: (Ordinary) instances of causation of a cause *C* causing an effect *E* are at least partially explained (in the capacity of reasons why) by the original cause *C* (similar to how, on Bennett's and Litlands pictures, factive grounding claims are grounded in the involved grounds). If we assume this to be causation (as Kovacs considers), we can solve Kovacs' challenge from the externality of causation: He dismisses the idea on the basis that causation is external: From *C* actually causing *E* it does not follow that necessarily, if *C* and *E* exist, *C* causes *E*. But pace Kovacs, the externality of causation is unproblematic, if not helpful here: Our proposal is that if *C* causes *E*, then *C*'s causing *E* is caused by *C* too. Now, because of the externality of causation, it is possible for *C* and *E* to be present without *C* causing *E*. Hence in these situations, *C* cannot cause *C*'s causing *E*. But since causation is an external notion, our proposal predicts no such thing and we can hold that *C* only causes *C*'s causing *E* if *C* causes *E*.

So perhaps Kovacs' idea was that since causation is external, for every *C* and *E*, if *C* causes *E* it must be possible that *C* and *E* obtain without *C* causing *E*, but it is unclear why we should subscribe to this stronger form of the principle. The following kind of case counts in favor of only accepting the weaker understanding of externality: If I see an event occur and on that basis form knowledge that the event occurred, then presumably, the event has caused my knowing (or coming to know) that the event occurred. But my coming to know that the event occurred could not have obtained without the occurrence of the event.

A proper investigation of the matter will further have to address the role of laws of nature, powers, or dispositions. One idea to consider here is that they are further reasons why instances of causation obtain. Similar to how the grounds need to work together with non-factive grounding claims to ground factive grounding claims on Litland's picture, causes would then work together with (e.g.) laws of nature to cause (or otherwise explain in the capacity of reasons why) their causing their effects. Depending on the details, we might even obtain the result that instances of causation are fully explained by their causes, if we assume that laws of nature are empty-base explained.

Nevertheless, I will assume that in analogy to non-factive grounding, it is sensible to talk of non-factive causation. We will express non-factive causal claims using the operator '$\Rightarrow_C$', and we will assume that they have the form '$\Gamma \Rightarrow_C P$'. While I will continue to primarily talk about zero-causation and non-factive causal claims, it must be stressed that we can sidestep the above problems and alternatively understand the following to concern laws of nature rather than non-factive causal claims by letting '$\Rightarrow_C$' express a connection of law of nature and assume that laws of nature can have the form '$\Gamma \Rightarrow_C P$'. First, it would already be remarkable if Litland's argument generalized to laws of nature. Second, because laws of nature and causation are arguably systematically related, this would raise the question whether instances of causation correspond to zero-instances (or empty-base instances) of laws of nature.

Coming back to Litland's metaphor of the explanatory machine: Where and why, if at all, does the following consideration go awry, which has been obtained from Litland's by substituting talk of (zero-)causation for talk of (zero-)grounding (I use fact-talk instead of proposition-talk because it fits causation more naturally than truth-talk):

> Think of a machine generating facts from other facts. The machine is fed facts, churning out facts caused by facts the machine is fed. A fact is *uncaused* if the machine never churns it out; a truth is *zero-caused* if the machine churns it out when it is fed *no* input.
>
> In terms of this picture, why would the machine give the verdict that '$\Delta \Rightarrow_C \phi$' is zero-caused if it obtains? Think of it like this. When the machine is fed no input the machine, instead of remaining idle, "simulates" the results of being fed various input. In simulating what happens when it is fed the facts Δ the machine proceeds just as it would have if it in fact had been fed Δ as input. If, when running the simulation, the machine churns out ϕ, the machine ends the simulation and churns out '$\Delta \mapsto \phi$'. Since the machine was fed no input this means that '$\Delta \mapsto \phi$' is zero-caused if it obtains.

One possible response would be to argue that causation facts cannot themselves be caused – perhaps, by their or causation's nature, they are not apt to be caused – and hence that the consideration *must* fail somewhere (but see Kovacs (2022) who argues against this idea). I want to consider two reactions to this: First, it not obvious whether the same move is available for the case of laws of nature, which would have to be done to analogously explain why the following law-employing version of Litland's consideration fails:

> Think of a machine generating truths from other truths. The machine is fed truths, churning out truths explained by laws of nature and the truths the machine is fed. A truth is *not explained by a law of nature* if the machine never churns it out; a truth is *empty-base natural-law-explained* if the machine churns it out when it is fed *no* input.
>
> In terms of this picture, why would the machine give the verdict that 'It is a law of nature that $\Delta \rightarrow \phi$' is empty-base natural-law-explained if true? Think of it like this. When

> the machine is fed no input the machine, instead of remaining idle, "simulates" the results of being fed various input. In simulating what happens when it is fed the propositions Δ the machine proceeds just as it would have if it in fact had been fed Δ as input. If, when running the simulation, the machine churns out ϕ, the machine ends the simulation and churns out 'It is a law of nature that $\Delta \rightarrow \phi$'. Since the machine was fed no input this means that 'It is a law of nature that $\Delta \rightarrow \phi$' is empty-base natural-law-explained if true.[192]

Second, instead of considering specific explanatory notions such as grounding, causation, and laws of nature, it seems that we can formulate the metaphor of the machine for because-claims in general. To this end, let us assume that there is a non-factive variant of 'because', which we will express with 'because$_{\text{NF}}$'. Further, recall from chapter 1 the sense of 'explains' in which it mirrors 'because': [*P*] explains$_{\text{B}}$ [*Q*] in this sense iff *Q* because *P*. Using 'explains$_{\text{B}}$' to express this notion, we can get the following final variant of Litland's story:

> Think of a machine generating truths from other truths. The machine is fed truths, churning out truths 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.
>
> In terms of this picture, why would the machine give the verdict that [ϕ because$_{\text{NF}}$ ψ] is empty-base explained if true? Think of it like this. When the machine is fed no input the machine, instead of remaining idle, "simulates" the results of being fed various input. In simulating what happens when it is fed the proposition ψ the machine proceeds just as it would have if it in fact had been fed ψ as input. If, when running the simulation, the machine churns out ϕ, the machine ends the simulation and churns out [ϕ because$_{\text{NF}}$ ψ]. Since the machine was fed no input this means that [ϕ because$_{\text{NF}}$ ψ] is empty-base explained if true.

It would be quite remarkable if Litland's argument would generalize to all (non-factive) because-claims in this fashion, yet it is not easy to see why it would not so generalize, unless we turn to the lack of modal stability again.

Now, let us turn to Litland's second consideration in favor of the zero-grounding of non-factive grounding statements. If it did not generalize to explanatory notions other than grounding, Litland could claim that it provides the crucial argument for the zero-grounding of non-factive grounding statements and thereby avoid the problem of overgeneralization. Litland's second consideration is based on his calculus for explanatory arguments and especially his introduction rule for '$\Rightarrow$'. Alas, none of the rules seem to deal on any feature special to grounding as opposed to say, explanation by law of nature. To see this, let us go

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192 If explanation involving laws of nature appears to you to more naturally involve facts than propositions, just make the relevant substitutions above. This does not seem to affect the appeal, whatever it may be, of the consideration.

through the rules (to be found in Litland 2017, 292ff.): INCLUSION, ASSUMPTION, NON-CIRCULARITY, and PLAIN CHAINING either concern arguments in general, or they clearly generalize from explanatory arguments that involve grounding to explanatory arguments that involve causation or other explanatory notions.

Perhaps, some may doubt NON-CIRCULARITY, for example on the basis of a potential case that there could be causal loops and hence valid circular causal explanatory arguments, while grounding loops are impossible. But for our purpose this is irrelevant because the argument for the zero-grounding of non-factive grounding does not involve NON-CIRCULARITY. Whether the argument generalizes to other explanatory notions thus does not depend on whether NON-CIRCULARITY does so generalize. The same holds for the rule CHAINING, which corresponds to the transitivity of the explanatory notions involved in the corresponding arguments: Perhaps transitivity fails for some explanatory notions such as causation, or perhaps 'because' is not transitive, while grounding is, but this would be irrelevant for our purpose because the argument that we consider does not involve CHAINING. In fact, for our purpose we only need to look at the following rule (Litland 2017, 297):

Given this rule, it can be shown that starting from an explanatory (grounding) argument, an explanatory argument from zero premises for the corresponding non-factive grounding claim can be constructed, and that from this resulting explanatory argument, an explanatory argument from zero premises for the conclusion that said non-factive grounding claim is non-factively zero-grounded can be constructed (see Litland 2017, 297). Given the further rule ⇒-Introduction (Litland 2017, 298), the argument can be extended to an argument from zero premises to the conclusion that the non-factive grounding claim in question is also *factively* zero-grounded. ⇒-Introduction plausibly generalizes to other explanatory notions (given that they support the distinction between factive and non-factive, which is an assumption that we have made above).

Litland requires further rules to construct arguments that start with an arbitrary non-factive grounding statement and derive from this that it is zero-grounded. But for our purpose we can focus solely on ⇒-Introduction: At least assuming the existence of non-factive causation claims, it seems plausible that there are explanatory causal arguments and indeed it also seems plausible that every causal explanation then corresponds to such an argument. Thus if ⇒-Introduction generalizes to (non-factive) causation, those arguments can be extended to arguments that show that the corresponding non-factive causal claims are zero-caused. Something analogous seems to hold for other explanatory notions and the generic 'because'.

So let us turn to what Litland says in favor of the crucial rule ⇒-Introduction:

> The only reasonable alternative view would require more than an explanatory argument E from Δ to ϕ in order to allow us to conclude $\Delta \Rightarrow \phi$. The alternative view would, in addition, require the premiss that E is explanatory. (If one adopted such a view the question would naturally arise what grounds the truth *that E* is explanatory.)
>
> We should resist this view. What is needed to conclude $\Delta \Rightarrow \phi$ is just an explanatory argument E from Δ to ϕ; there is no need for the further truth that E is explanatory. The requirement that we need this further truth is as inappropriate as the demand that in order to apply conditional proof we need not just a valid argument D from ϕ (and some further premisses) to ψ, we need, in addition, the premiss that D is valid. It might be helpful to think about this in terms of the machine picture.
>
> To determine whether $\Delta \Rightarrow \phi$ we go to a machine that encodes every explanatory inference. We then ask the machine to simulate the result of being fed input Δ. The machine then procedes [sic] to run the simulation. If the machine churns out ϕ it also churns out $\Delta \Rightarrow \phi$ and ends the simulation. At no step in this process is it necessary for the machine to check whether the inferences it carried out were explanatory. (Litland 2017, 297)

As far as I can see, there are two considerations here: First, once more, the metaphor of the machine that I have already addressed seems to generalize to other explanatory notions; at least it is unclear why it should not do so. Second, the idea that an alternative to $\Rightarrow$-Introduction would have to require as an additional premise the claim that the argument in question is explanatory, which, according to Litland, would be just as inappropriate as to require an additional premise of validity in applications of conditional proof.

If this consideration is convincing, I do not see why it should not generalize to other explanatory notions. Again, a problem for the generalization to causation could be that non-factive causation facts might not be the right thing to be caused (see also below). Yet, if the generalization extends to the generic 'because$_{NF}$', instances of the generic 'because$_{NF}$' that correspond to instances of causation would be empty-base explained, albeit not empty-base *causally* explained. However, it is unclear how convincing Litland's consideration is in the first place: Even if we suppose that the analogy with conditional proof holds, are there not other candidates for supplementary premises that an alternative to $\Rightarrow$-Introduction could require? For example, Dasgupta (2014b) effectively suggests that non-factive grounding claims are grounded in certain essences. What Litland says does not seem to fully address such a rival proposal. Lastly, perhaps the raw intuitive appeal of $\Rightarrow$-Introduction is stronger than that of its analogues for laws of nature, causation, etc. But, first, I cannot find that it is, and, second, it would be unsatisfactory if this were the only disanalogy between the cases.

Given these considerations, the situation concerning Litland's argument is this: First, in any case, one might think that even if non-factive grounding is zero-grounded, however this is established, this result should not stand or fall with other explanatory links being zero-explained or not – at least one might have

thought that this latter result cannot be as easily established as can be done with Litland's argument, if it is successful. Second, the following dilemma arises for proponents of Litland's consideration: The first horn consists in the challenge to point out where Litland's consideration holds for grounding but fails for other kinds of explanatory links, for example causation. The second horn consists in accepting the conclusion that every true non-factive explanatory link (and every true non-factive because-claim) is empty-base explained.

So maybe Litland's two considerations should not be conceived as arguments on their own for the thesis that non-factive grounding facts are zero-grounded and more as a kind of aid to make sense of the zero-groundedness of non-factive grounding facts. In that case, the required additional reasons to accept the thesis could perhaps be provided by the neatness of the thesis as a solution to the question of what grounds grounding, and by its theoretical utility and potential to solve the 'status problem'.[193] Indeed, further arguments for the thesis may be possible, for example Krämer (manuscript) investigates the grounds of ground using Fine's (2017a, 2017b) truthmaker semantics, and obtains the result that given plausible assumptions, non-factive grounding claims may well be zero-grounded, without giving rise to a problem of overgeneralization.

Setting aside Krämer's idea and focusing on Litland, a problem arises even if we assume that the alternative interpretation of the proposal from the previous paragraph is correct: First, it would presumably be equally neat (if not neater) to assume that other non-factive explanatory links are empty-base explained as well. Furthermore, surely theoretical advantages of such a thesis could be found; to give an example that comes to mind, a sort of Humean may welcome the thesis that no law of nature remains unexplained, given the assumption that all laws of nature are empty-base explained. But then the question arises whether Litland's considerations can help to make sense of the empty-base explanation of, e.g., causal explanatory links or laws of nature. If they can, it once again appears that his argument generalizes to these kinds of explanations as well. If we assume that his considerations cannot, the question is what it is that differentiates the cases in which Litland's considerations work from those in which they do not.

To explain this further, assume that going through Litland's consideration is supposed to help make sense of the zero-groundedness of non-factive grounding facts. As I have argued above, we can go through Litland's consideration with laws of nature, non-factive causation (if there is such a thing), or a general non-factive 'because' in mind instead of grounding, without it being clear whether and at what point these analogous considerations fail. But if we assume that one of the

193 Litland (2017, 283ff.).

analogous considerations fails, it seems Litland's original consideration concerning grounding does not provide enough to make sense of the zero-groundedness of non-factive grounding facts – it remains unclear why the consideration should go through for grounding, but not for laws of nature, non-factive causation, or a non-factive general 'because'.

To approach the thought of other explanatory links also being empty-base explained, two thoughts come to mind: First, there is the question whether conditions of candidacy for empty-base explainability can be identified.[194] Second, note that given the assumption that all (non-factive) explanatory links are empty-base explained, it does not (obviously) follow that laws of nature or (non-factive) causal links are zero-*caused* (or consequents of laws of nature with an empty antecedent). This is because the latter might in principle be empty-base explained in a different, non-causal way; they might for example be zero-*grounded*. In any case an explanatory notion would be required that figures in the link of the relevant empty-base explanations. Causation may not be a good candidate: (non-factive) causal links may not be the right kind of fact to be caused, or zero-causation may be impossible in general.

But metaphysical grounding does not appear to be a good candidate either: First, (non-factive) causal links do not have the intuitive air of insubstantiality around them that zero-grounded facts could be thought to possess. Second, at least if we accept that $[\Gamma \Rightarrow P]$ entails $[\Box(\Gamma \rightarrow P)]$, then all zero-grounded facts obtain with metaphysical necessity – but we would not want to accept that (non-factive) causal links obtain with metaphysical necessity, at least not on the basis of Litland's considerations about the grounds of grounding. More plausibly, (non-factive) causal links obtain with natural necessity, which would resonate with the idea that the kind of link involved in empty-base explanations of (non-factive) causal links is a law of nature or involves natural grounding.

We will leave the discussion of Litland's considerations at this and instead pursue our question from the introduction that has just reoccurred: Is zero-causation possible, and if not, why not?

5.2 Is zero-causation possible?

In order to defend the possibility of zero-causation, one could attempt the kind of strategy that Fine uses with zero-grounding and the empty conjunction: As we have seen in chapter 2, Fine takes a general principle of grounding, namely the

194 For a look at this question from an epistemological angle see chapter 7.

principle that the conjuncts of a true conjunction together ground the conjunction, and argues that the principle has a limiting instance, namely the empty conjunction and its zero conjuncts, from which an instance of grounding with an empty set of grounds – an instance of zero-grounding – follows. Correspondingly, for the case of zero-causation, one could try to find a general principle of causation (or perhaps a corresponding law of nature) for which there is an instance involving an effect and an empty set of causes. Alas, I do not know of any such principle.[195]

On the other hand, arguing that zero-causation is *im*possible is not straightforward either: While it could be thought to be an obvious, perhaps conceptual, truth that for every effect (viz. for everything that is caused) there is a cause, such considerations – if they remain unsupported by further argument – are unavailable once the possibility of empty-base explanation (and zero-grounding in particular) has been granted. After all, one could have easily thought it obvious or conceptually true that whenever something is grounded, it must have grounds or that whenever there is an explanation why there must also be reasons why – but these assumptions are false given the possibility of zero-grounding and empty-base explanation which we presuppose here.

Nevertheless, in order to find out whether zero-causation is possible, we can try to take a closer look at accounts of causation to see whether there is anything in the nature of causation that makes zero-causation impossible (or perhaps possible – depending on what we find). Furthermore, the friend of zero-grounding and empty-base explanation in general will want to make sure that if there is a feature of causation that makes zero-causation impossible, nothing like this feature is shared by grounding or explanation in general. In this vein, in the next subsection I will take a look at the form of causal principles, and in the following subsection I will look at the connection between causation on the one hand and causal powers and dispositions on the other, and compare it to the connection between grounding and essence.

195 A natural starting point when searching for candidates for zero-causation should be found in cosmology, it strikes me: Theories of first events or the beginning of time appear to be what should be looked at here. Hicks and Wilson (2021) may have identified a candidate: In their paper, they argue that statements of probability (or, better, I think: probabilistic/statistical laws of nature) play the role of higher-order reason in explanation. In the end, they float the idea of null-explanation by probability (which is (in effect) a kind of empty-base explanation and almost what I propose for explanation by high probability in chapter 3) as a kind of explanation for why there is anything at all. Most intriguingly, they suggest on the basis of Demarest (2016) that Boltzmannian statistics might give rise to such null-explanations.

What follows is not a comprehensive study of how different accounts of the nature of causation bear on the possibility of zero-causation. For example, one could further think about whether the temporal nature of causation has consequences for the possibility of zero-causation, or one could systematically look at accounts of causation in the literature to see whether they provide room for zero-causation.[196] Here, I am content with providing an initial exploration into how the two aspects of the nature of causation mentioned might bear on the possibility of zero-causation.

5.2.1 Explanation by law of nature and general principles

If empty-base explanation by law of nature is possible, then given the close connection between causation and laws of nature, at least some of those explanations might correspond to instances of zero-causation. Indeed, Hicks and Wilson (2021) have recently identified a real science candidate for an empty-base explanation of the first event of the universe that I will present now.

Some background is required: Albert's and Loewer's *mentaculus* involving Boltzmannian statistical mechanics is brought forward as a framework to "explain the second law of thermodynamics, various arrows of time, and [to formulate] a complete scientific theory of the universe" (cf. Loewer forthcoming). It consists of the following ingredients:

1. fundamental dynamical laws that describe the evolution of the fundamental microstates of the universe,
2. the Past Hypothesis: a boundary condition characterization of the macro state $M(0)$ of the universe at its beginning,
3. Statistical Postulate: there is a uniform probability distribution specified by the standard Lebesgue measure over the physically possible microstates that realize $M(0)$.

Demarest (2016) suggests that the coming about of the microstate realizing $M(0)$ is an initial chance event. It is not caused by another event, but there was an objective probability that it obtain, and this this chance is captured by the laws of the mentaculus. Now, Hicks and Wilson (2021) suggest in effect (but using slightly different terminology) that these laws afford an explanation by status of the

196 One kind of account that comes to mind is that of mark transmission accounts like that developed in Salmon (1984), according to which causation involves transmissions of a certain kind of change in features ('marks'). With respect to zero-causation, *prima facie*, such accounts give rise to the question what should be transmitted from where in an instance of zero-causation.

initial microstate of the universe involving a probabilistic law of nature. So assuming that the mentaculus picture is correct, why would the initial microstate of the universe obtain then? *Just because!*[197]

Further investigation is required to discern what exactly the form of the laws involved in the candidate explanation above is. In general, the possibility of empty-base explanation by laws of nature and by extension zero-causation depends on what form laws of nature can in general have. For example, consider the following core of Woodward's interventionist theory for causal explanation and what form the general principles have according to it:

> Suppose that M is an explanandum consisting in the statement that some variable Y takes the particular value y. Then an explanans E for M will consist of (a) a generalization G relating changes in the value(s) of a variable X (where X may itself be a vector or n-tuple of variables X_i) and changes in Y, and (b) a statement (of initial or boundary conditions) that the variable X takes the particular value x. A necessary and sufficient condition for E to be (minimally) explanatory with respect to M is that (i) E and M be true or approximately so; (ii) according to G, Y takes the value y under an intervention in which X takes the value x; (iii) there is some intervention that changes the value of X from x to x' where $x \neq x'$, with G correctly describing the value y' that Y would assume under this intervention, where $y' \neq y$. (Woodward 2003, 203)

Suppose for the sake of argument that the general principles that underlie causation in this way have the following law-form: '$\Box_N \forall x(Fx \rightarrow Gx)$'. Let us further assume that the instances of this law would then correspond to non-factive causal links of form '$Fa \Rightarrow_C Ga$'. But then no non-factive causal link seems to have the form required for zero-causation, that is '$\Gamma \Rightarrow_C P$', where 'Γ' stands for an empty plurality of facts!

In defense of the possibility of zero-causation, at least two issues with this train of thought can be identified: First, it is not quite clear what the argument is that establishes that general principles of the relevant form have to underlie causation. Second, with enough conceptual flexibility, the conclusion might not follow: Consider the lambda-operator applied to a closed sentence: '$\lambda x(P)$'. Applied to 'a' this delivers 'P'. Suppose we can extend the applicability of the lambda-operator to sets of sentences, especially to the empty set of sentences. Now consider the following law: $[\Box_N \forall x((\lambda y \Gamma)x \rightarrow Gx)]$. This arguably has the form '$\Box_N \forall x(Fx \rightarrow Gx)$'. But if $[\Box_N \forall x((\lambda y \Gamma)x \rightarrow Gx)]$ is true, $[\Box_N \forall x(\Gamma \rightarrow Gx)]$ is plausibly true as well and vice versa – but the latter is a law that plausibly can underlie $[\Gamma \Rightarrow_C P]$.

In future research I suggest we look at further forms laws of nature might take (for example, we should look at sententially (plural) quantification and sentential

197 Whether we may furthermore call this *causation ex nihilo* depends on (among other things) the relation between causation and laws of nature.

operators both of which contribute to the existence of zero-instances of principles of ground), investigate whether they allow for empty-base instances, and then apply the findings to candidate cases like Hicks and Wilson's, or come up with toy cases and scenarios in which those laws would intuitively provide empty-base explanations (by law of nature). In this way, the intelligibility of empty-base explanation by (generalized) laws of nature could be further supported.

Let us take some first steps into this direction.[198] This is (one version of) the grounding schema for generalized conjunction:

$$\Gamma < \Lambda(\Gamma)$$

The notion of generalized conjunction allows the conjunction of sets of propositions. In particular, it allows to form the empty conjunction, which is grounded in its zero conjuncts. The following is a candidate for the corresponding metaphysical law. Let '■' express the relevant law status and let '→' express a version of the material conditional that may be combined with a (possibly empty) plurality of sentences on its left-hand side and one sentence on its right-hand side, and let the corresponding conditional sentence be true iff at least one of its antecedent sentences is false or its consequent sentence is true. Thus if there is no antecedent sentence, it is true iff the conditional's consequent sentence is true. Furthermore, allow the plural sentential quantification to quantify over the empty plurality:

$$\blacksquare \forall pp(pp \rightarrow \Lambda(pp))$$

Laws of nature are sometimes assumed to have a quantified conditional form like this:

$$\blacksquare \forall x(Fx \rightarrow Gx)$$

But as with Woodward's more concrete interventionalist principles, it seems that laws like this cannot have the required edge case: Every instance of this schema is such that the antecedent of the embedded conditional involves predicating F of something, so no instance can correspond to an explanation whose base is empty. This point arguably remains even if we consider plurally quantified laws and allow for quantification over the empty plurality of entities, i.e. like this:

$$\blacksquare \forall xx(Fxx \rightarrow Gxx)$$

Here too, the antecedent of the embedded conditional of the instance using the empty plurality of entities would still predicate something of the empty plurality

198 For a recent zero-grounding-friendly account of the laws of metaphysics that might be of use in this context see Litland and Haderlie (manuscript).

and hence not afford an empty-base explanation. But now consider the form of the metaphysical law for the generalized conjunction. By using '$O()$' as a placeholder for a sentential operator that can take (a possibly empty) plurality of sentences as an argument, we can obtain the following more general form:

$$\blacksquare \forall pp(pp \rightarrow O(pp))$$

Some questions that arise then are whether there are possible candidates for laws of nature that have this form, whether the example of Hicks and Wilson (2021) can be formulated in such a form, and whether there are (toy) scenarios in which laws of nature like this intuitively seem to provide explanations. In principle, by describing such laws of nature and corresponding scenarios, a case could be made for the intelligibility of the idea of empty-base explanation involving laws of nature.[199]

Before we leave this strand of thought to further research, let me point out a potential challenge: What differentiates laws of natures from laws of metaphysics (aside from, arguably, their modal strength) is perhaps unclear, but one might be particularly interested in finding out whether empty-base explanation could be afforded by laws with the *diachronic* character that laws of nature often seem to have: They link goings-on at some point in time to goings-on at a later point in time and thereby help explain the latter in terms of the former. Diachronicity is also often mentioned as an aspect that helps to distinguish causation from grounding. Thus, insofar as we are interested in the intelligibility of causation ex nihilo, it seems apt to try to identify candidates for laws with a diachronic character.

5.2.2 Causal powers, dispositions, and essences

According to some, causation involves manifestation of causal powers. For example, according to Mumford and Anjum (2011, 7), "[effects] are brought about by powers manifesting themselves". Furthermore, it is plausible to believe that the causal powers that are manifested in an instance of causation 'belong' – in a certain sense – to the cause in question or an entity that figures in it. For example: Suppose *x*'s joking causes *y* to blush. According to the idea just alluded to, there must be a causal power involved that belongs to *x* or *x*'s joking – namely a power to make things (or *y* in particular, or things like *y*) blush ('in the relevant circumstances' may have to be

199 While the example of Hicks and Wilson (2021) claims some actual plausibility, we should distinguish looking for candidates for laws of nature that could be (for all that we know) actual from candidates that could be laws of nature in some conceivable scenario. The latter would be sufficient to establish the conceivability of empty-base explanation by law of nature.

added). Now this thought might provide us with a reason to believe that zero-causation is impossible: According to the idea just sketched, for there to be causation, there must be causes (or constituents of causes) that bear causal powers. But the hypothetical case of zero-causation does not involve causes and thus does not involve anything that could bear the required powers.

Let us compare this with the case of grounding: While grounding does not bear a connection to powers like causation does (at least no such connection has been discussed in the literature, as far as I know), the relation that grounding bears to *essence* is somewhat similar to the relation that causation bears to causal powers. But there is one crucial difference: While – per our assumption – causal powers associated with an instance of causation belong to the causing fact or some of its constituents, the essence that corresponds to cases of grounding belongs to the groundee or some of its constituents.

While there are many possibilities how to exactly spell out the connection between grounding and essence that can be roughly stated like this, some such connection is widely assumed. It can be supported by intuition, the fact that it might allow for the unification of the two notions (or at least mutual elucidation), and the idea that relations *like* grounding that have different connections to essence are therefore just that: grounding-*like* relations that are not the kind of grounding that we talk about[200] Thus, for zero-grounding, no analogous problem to that of powers for zero-causation arises, because the connection between grounding and essence does not require the essence that corresponds to an instance of grounding to belong to a corresponding ground or constituent thereof. Instead, the connection requires an essence that corresponds to a groundee or constituent thereof. Hence, the connection between grounding and essence does not require each instance of grounding to involve a ground and thereby leaves room for zero-grounding.

To put the difference between grounding and causation suggested here into a slogan: Causation is a *bottom-up* or *upwards* explanatory relation, while grounding is a *top-down* or *downwards* explanatory relation. The more general conjecture to emerge here then is this:

200 For references and more discussion of the connection between grounding and essence, and grounding-like relations (such as metaphysical causation perhaps) that bear different relations to essence see chapter 4.5.

(Conjecture)
Downwards explanatory relations allow for corresponding empty-base explanations, but upwards explanatory relations do not allow for corresponding empty-base explanations.[201]

So how could the friend of zero-causation attempt to deal with this train of thought? First, of course, the connection between causation and causal powers that I have assumed can be reconsidered. In fact, according to another idea, causation is closely related to dispositions. For example, according to this strand of thought, the causal relation between Moriarty's throwing the ball at the window and the window's breaking bears some interesting relation to the window's disposition to break. The thought the friend of zero-causation might then try to develop is that perhaps instances of causation do not require a power that is associated with a cause, but merely a disposition associated with the effect.

Second, at this point, we have already been quite (some would perhaps consider this to be an understatement) conceptually liberal and permissive in allowing zero-grounding and empty-base explanation: Can perhaps a little more permissiveness of this kind help the friend of zero-causation? Well, in a theoretical setting where we have already accepted grounding without grounds, explanation why without reasons why, and where we are (more or less seriously) contemplating causation without causes, the friend of zero-causation might be encouraged to go just a little further and propose the existence of powers of the empty set of causes.

Recall here the idea that was floated at the end of the previous chapter, according to which logical theorems such as $[P \vee \neg P]$ are empty-base explained and the corresponding explanatory links are part of the essence of the empty set of propositions or facts (or part of the alethic essence of the empty plurality of propositions). The relevant explanatory notion would provide further candidates for an 'upwards explanatory relation' that can figure in a corresponding empty-base explanation. If such an explanatory relation exists, the above conjecture that downwards explanatory relations allow for corresponding empty-base explanations, but upwards explanatory relations do not allow for corresponding empty-base explanations, would fail. But, of course, it could still be argued that the kind of empty-base explanation of logical theorems proposed here is possible (because the required essential truths obtain, i.e. the empty set of propositions has a suitable essence), while zero-causation is impossible (because the required causal powers cannot exist, i.e. the empty set of causes cannot be associated with any causal powers).

201 Note that, as we have seen in chapter 4, this distinction may not be exhaustive.

We are here confronted with the following problem: It is somewhat hard to see how conceptually and metaphysically permissive we should be; the question is how far we can go without – well – losing it. Aside from taking seriously intuitions about understanding why (as I will argue in chapter 7 we must), and taking as a constraint the existence of general principles or laws that generate empty-base instances, one answer presumably lies in trying to put the permissive apparatus to the test – if it allows for fruitful and interesting theorizing, it earns its keep; if it does not, then either it was a mistake to allow for it, or it does not really matter in any case, as long as we do not continue to try theorizing using the apparatus. With respect to zero-causation, perhaps the following then is the lesson to be drawn from the considerations above: Zero-causation may be (at least conceptually) possible, but examples and concrete applications would have to be investigated to take the idea seriously.

As already mentioned above, one intriguing direction for investigation here has been identified by Hicks and Wilson (2021). According to them (and based on the discussion of Demarest 2016 they rely on), Boltzmannian statistics does, in effect, generate a statistical empty-base explanation of part of concrete physical reality. Moreover, given what I have said above concerning the relationship between empty-base explanation and the question of why there is anything, the resulting explanation would be a candidate for an empty-base explanation of why there is anything at all by statistical law of nature.

In future research, one could attempt to extend insights from Litland and Haderlie's (manuscript) zero-grounding-friendly account of metaphysical laws to the case of laws of nature to investigate both the mentaculus explanation of the initial event of the universe and the possibility of empty-base explanation by law of nature and causation more closely.

6 Self-Explanation

The purpose of this chapter is to explore the idea of a self-explanatory proposition and to develop a novel notion of self-explanation. The idea of self-explanation is as controversial as it is philosophically interesting: On the one hand, certain alleged fundamental facts or first principles, e.g. God's existence, have sometimes been taken to be self-explanatory.[202] As already mentioned in the introduction, the idea of a self-explanation is one way of spelling out the idea of an ultimate explanation, i.e. an explanation whose explanans does not give rise to further why-questions. On the other hand, self-explanation is frequently considered to be incoherent and unintelligible.[203]

As we will see, given the inclusive sense of 'explains', which was introduced in chapter 1 and in which both the sources and the link of an explanation can be said to explain its explanandum, two importantly different senses in which a proposition can be (at least partially) self-explanatory can be distinguished. In the following I want to focus on one of these notions, which is less often (if ever) recognized, even though it is more viable than the other. As it turns out, to define a corresponding notion of a *fully* self-explanatory proposition, the notion of an empty-base explanation is required too. This chapter argues that the resulting kind of self-explanation is possible (or at least compatible with the nature of explanation) and identifies some in principle candidates for such propositions.

This is the plan for the chapter: Section 6.1 approaches the notion of self-explanation and presents a family of arguments against its possibility. After having recapped some general assumptions about explanation from chapter 1, section 6.2 disambiguates two notions of (self-)explanation – the *restrictive* and the *inclusive* sense – the latter of which is then argued to be able to avoid the arguments from the previous section. Section 6.3 uses these findings to offer a solution to a circularity problem for Humeanism about laws of nature.

Section 6.4 then combines these previous results with the notion of an empty-base explanation to introduce the notion of an *empty-base link-self-explanation* and defend it against two further arguments against self-explanation due to Kovacs (2018). Section 6.5 develops the notion further and investigates its application to the

202 Proponents of the principle of sufficient reason (PSR) are sometimes drawn to ideas like this (cf. Guigon 2015). Spinoza for example considers God to be a *causa sui* (cf. Lærke 2011). The idea can also be found in the literature on the question why there is anything at all, e.g. Nozick (1981, 115ff.).

203 E.g. Oppy (2006, 277ff.), Kovacs (2018), and relatedly Schnieder (2015) on the asymmetry of 'because'.

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ideas that first principles, God's existence, or certain grounding propositions themselves are self-explanatory. As it turns out, the notion can help make sense of Nozick's (1981, 119ff.) idea of "explanatory self-subsumption" and capture some strongly rationalist theses related to necessitarianism and the PSR. Section 6.6 concludes by showing that certain historical ideas about the explanation of God's existence give rise to a proposal for a self-explanation in the developed sense.

6.1 Approaching self-explanation

Let us approach the topic of self-explanation by observing what I take to be a conceptual platitude: For a proposition to be self-explanatory is for it to explain itself. Or, schematically:

> For a proposition *x* to be self-explanatory is for *x* to explain *x*.

Here, of course, 'explains' has to be used in the relational sense in which it expresses a relation that relates propositions or facts, viz. the kind of entities that constitute explananda and explanantia.

Before we disambiguate 'explains' further, note that the platitude already helps to distinguish self-explanation from related notions like our own empty-base explanation and Dasgupta's (2014b, 2016) explanatory autonomy, which might play a similar theoretical role or provide similar explanatory benefits as self-explanation proper. For example, one purpose of all three notions is to help satisfactorily end explanatory inquiry or avoid it all together.

Nevertheless, neither the notion of explanatory autonomy nor the notion of an empty-base explanation capture the idea expressed by the above platitude, namely that of a proposition *explaining itself*: Firstly, an explanatorily autonomous proposition is not explained, rather it is such that *qua* being autonomous it does not require an explanation.[204] Therefore, it is not self-explanatory in the proper sense. Secondly, empty-base explanations are (to foreshadow a little: at least in general) not instances of a proposition explaining itself, as is for example witnessed by the zero-grounding explanation of non-factive grounding claims (à la Litland 2018): Non-factive grounding claims are (empty-base) explained, but they do not explain themselves.[205]

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204 Perhaps it is possible that a proposition does not *require* an explanation and nevertheless *has* an explanation, but even this case does not capture the idea of a proposition *explaining itself*.
205 Granted, a more relaxed sense of a self-explanatory proposition might exist in which for example merely empty-base explainable propositions count as self-explanatory. Perhaps such a sense functions similarly to 'self-evident': A self-evident proposition arguably need not be evidence for

Eventually, a comparison of the advantages and disadvantages of the three related notions will be desirable, but here my primary task is to investigate self-explanation proper, as captured by the platitude (although see section 6.4 for some comparison of empty-base explanation and self-explanation with respect to the idea of ultimate explanation). Indeed, the possibility of self-explanation in the platitudinous sense is heavily contested. While this is often based on raw intuition, here I focus on the following three arguments from the asymmetry of related notions:

'From "because"':

(P1) For any *P*, *Q*: If the proposition that *P* explains the proposition that *Q*, then *Q* because *P*.

(P2) For no *P*: *P* because *P*.

(P3) For any *x*: If *x* explains *x*, then there is a proposition that *P* such that the proposition that *P* explains the proposition that *P*.

(C1) For no *x*: *x* explains *x*.[206]

'From explanatory dependence':

(P4) For any *x*, *y*: If *x* explains *y*, then *y* stands in an explanatory dependence relation to *x*.

(P5) For no *x*: *x* stands in an explanatory dependence relation to *x*.

(C1) For no *x*: *x* explains *x*.[207]

'From reasonhood':

(P6) For any *x*, *y*: If *x* explains *y*, then *x* is a reason for *y*.

(P7) For no *x*: *x* is a reason for *x*.

(C1) For no *x*: *x* explains *x*.

These arguments are similar in form: The first premise establishes a link between explanation and a further notion, the second premise establishes the asymmetry of that notion, and from this the asymmetry of explanation follows. The arguments are valid, so the proponent of self-explanation has to address the premises.

Admittedly, the arguments may perhaps be of somewhat limited dialectical value: A staunch defender of self-explanation might rather take them as counting against one of their premises than be convinced by them. In particular, the

itself. Rather, no further proposition is required for it to be evident. Here, though, I want to focus on the idea captured by the platitude above.

206 For an argument like this see Oppy (2006, 277f.). Let us ignore complications that might arise from quantifying into the contexts of 'explains' and 'because': My purpose here is to present a notion of self-explanation that can avoid these arguments independently of such concerns.

207 An argument like this is suggested in Schnieder (2015).

premises (P2), (P5) and (P7) that establish the asymmetry of the respective notion related to explanation seem to come quite close to the conclusion that nothing explains itself. Nevertheless, these premises enjoy considerable intuitive appeal and are widely endorsed.[208]

Therefore, I consider denial of either (P2), (P5) or (P7) to be a significant cost that would require serious argument.[209] So instead of taking this route in defense of the possibility self-explanation, I will now employ the distinction between the restrictive and the inclusive sense of 'explains' introduced in chapter 1: While we can maintain premises (P1), (P4) and (P6) given the restrictive sense, these premises are doubtful given the inclusive sense (of course, we are still free to endorse the three simple arguments if we choose to understand 'explains' in the restrictive sense throughout).

6.2 Two notions of (self-)explanation

Recall that in chapter 1 I argued that there is an *inclusive sense* of 'explains' in which not only the reasons (i.e. elements of the base) involved in an explanation (at least partially) $\text{explain}_{\text{inclusive}}$ the explanandum, but also the link of an explanation (partially) $\text{explains}_{\text{inclusive}}$ its explanandum. As explained there, this sense of 'explains' stands in contrast to a more *restrictive sense* which corresponds more closely to because-statements and in which only the elements of the explanatory base (i.e. the reasons why), but not the link of an explanation (partially) $\text{explain}_{\text{restrictive}}$ its result.

To make this explicit, we can define the two senses as follows:

- For all x, y: x (at least partially) $\text{explains}_{\text{restrictive}}$ y $\text{iff}_{\text{def.}}$ x is in the base of an explanation whose result is y.
- For all x, y: x (at least partially) $\text{explains}_{\text{inclusive}}$ y $\text{iff}_{\text{def.}}$ x is in the base of an explanation whose result is y, or x is the link of an explanation whose result is y.[210]

208 But, of course, not universally: For example, one reason to deny causal irreflexivity may stem from the possibility of time travel and corresponding causal loops, cf. Smith (2019). For a critical discussion of the irreflexivity of metaphysical dependence see Jenkins (2011), and for the irreflexivity of grounding see Kovacs (2018) and the references therein.

209 For the case of grounding explanations, the start of such an argument might be provided by the puzzles of ground given in Fine (2010) and Krämer (2013). For some further discussion concerning the irreflexivity of grounding explanation see Bliss and Trogdon (2016, sec. 6.2).

210 This should be understood as a definition of *immediate* explanation to avoid ruling out here that x may in an inclusive sense explain y by in the restrictive sense explaining a link z of an explanation of y (and assuming a principle of transitivity, cf. the next section).

Correspondingly, we can distinguish self-explanation in the inclusive sense from self-explanation in the restrictive sense: Proposals for self-causing or self-grounding facts concern self-explanation in the restrictive sense, while we will encounter candidates for self-explanations in the inclusive (but not restrictive) sense below.

Given this distinction, we can try to defend one type of self-explanation by arguing that the arguments against self-explanation only apply to the other type of self-explanation. Indeed, it can be argued that the first premise of each of the three arguments above is false given the *inclusive* sense of 'explains': For example, so understood, (P1) is false because if a proposition that *P* explains$_{\text{inclusive}}$ a proposition that *Q*, then it is not in general the case that *Q* because *P*. The two sentential arguments of a 'because'-statement correspond to the base and result of an explanation and it is normally not the case that the explanatory link of an explanation is also in the base of the relevant explanation and thereby occurs in the corresponding 'because'-statement in this capacity. Rather, explanatory links correspond in a different way to 'because'-statements, for example by being tracked by the latter.[211]

Analogous considerations arise for (P4) and (P6) of the other arguments: If *x* explains$_{\text{inclusive}}$ *y*, then it is not in general the case that *y* suitably depends on *x*: For example, the explanandum of a causal explanation does not causally depend on the causal connection or law of nature connecting it and its cause. Likewise, the grounding connection between a ground and a groundee does not normally also ground the groundee.[212] Explanatory links involve the explanatory priority relation between an explanation's sources and its result, but in general do not themselves stand in such a relation to the result. Similarly, (P6) is false because if *x* explains$_{\text{inclusive}}$ *y* (viz. by being the link of an explanation of *y*), then it is not in general the case that *x* is a reason for *y*. The base of an explanation consists of reasons for the explanation's result, but links normally do not play this role; instead links connect the reasons that constitute the explanation's base with its result.[213]

There is a more general lesson here: 'explains$_{\text{inclusive}}$' does not necessarily share the structural features of 'explains$_{\text{restrictive}}$'. On the tripartite view of explanation and 'because' introduced in chapter 1, structural features often ascribed to explanation (e.g. asymmetry and transitivity) are captured by ascribing corresponding structural features to the link component. Additional analogous constraints on, e.g., the relation between explanatory links and results are unmotivated on this view: According to it,

211 Cf. Schnieder (2010).

212 Cf. Bolzano (1837, secs. 199, 344f.) and Litland (2018).

213 See chapter 1 and the discussion in Skow (2016).

what the relevant structural features of explanation come down to are the structural features of explanatory links. But normally, no additional explanatory links hold between the link and result of an explanation, so there appears to be no reason to assume corresponding structural features to govern the relation between link and result. In fact, stipulating corresponding constraints in addition to the structural features of the links would result in a disjoint account.

These considerations allow (but do not compel) us to maintain that self-explanation$_{\text{restrictive}}$ falls prey to versions of the three arguments in which each occurrence of 'explains' is understood in the restrictive sense while maintaining the intelligibility of self-explanation$_{\text{inclusive}}$:

'From "because" – revised':

(P1*) For any P, Q: If the proposition that P explains$_{\text{restrictive}}$ the proposition that Q, then Q because P.

(P2) For no P: P because P.

(P3*) For any x: If x explains$_{\text{restrictive}}$ x, then there is a proposition that P such that the proposition that P explains$_{\text{restrictive}}$ the proposition that P.

(C1*) For no x: x explains$_{\text{restrictive}}$ x.

'From explanatory dependence – revised':

(P4*) For any x, y: If x explains$_{\text{restrictive}}$ y, then y stands in an explanatory dependence relation to x.

(P5) For no x: x stands in an explanatory dependence relation to x.

(C1*) For no x: x explains$_{\text{restrictive}}$ x.

'From reasonhood – revised':

(P6*) For any x, y: If x explains$_{\text{restrictive}}$ y, then x is a reason for y.

(P7) For no x: x is a reason for x.

(C1*) For no x: x explains$_{\text{restrictive}}$ x.

Thus, we are free to deny the intelligibility of self-explanation$_{\text{restrictive}}$ while maintaining the intelligibility of self-explanation$_{\text{inclusive}}$, candidates for which we will look at in what follows.

6.3 On a circularity problem for Humeanism about laws of nature

Before we combine the notions of self-explanation$_{\text{inclusive}}$ and empty-base explanation to investigate the possibility of *fully* self-explanatory$_{\text{inclusive}}$ propositions, I want to show how the previous result applies to matters that the reader might

consider a bit more grounded. According to Humeanism about laws of nature (as I will understand them here), laws of nature are universal generalizations (or at least partially grounded in such). This idea is confronted with the following circularity problem that the distinction from the previous section can help solve:

Consider an explanation of [Ga] whose explanatory link is identical to or grounded in the universal generalization [$\forall x(Fx \rightarrow Gx)$], and whose explanatory base contains [Fa].[214] Together, the link and the base explain the result, so in particular:

(1) [$\forall x(Fx \rightarrow Gx)$] partially explains [$Ga$].

But it is a widely accepted grounding principle about (true) universal generalizations that they are (partially) grounded in their instances, so [$Fa \rightarrow Ga$] partially explains [$\forall x(Fx \rightarrow Gx)$]. Equally, it is widely accepted that if a material conditional has a true consequent, the former is grounded in the latter. So [Ga] explains [$Fa \rightarrow Ga$], and an application of transitivity for grounding yields:

(2) [Ga] partially explains [$\forall x(Fx \rightarrow Gx)$].[215]

But (1) and (2) constitute an instance of symmetric (partial) explanation and an application of transitivity would even yield an instance of (partial) self-explanation.[216]

While several solutions to this problem have been discussed in the literature, the observations from the previous section afford a particularly straightforward solution: The derivation of a symmetric instance of 'explains' can only succeed given the inclusive sense of 'explains': (1) is true only in this sense. But as we have seen, there is reason to believe that structural features of explanation such as asymmetry only apply to the restrictive ('because'-corresponding) sense of 'explains', so the problem is avoided.[217]

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214 As always, I use '[. . .]' to refer to the proposition or fact expressed by the sentence within the brackets.

215 For proponents of the relevant grounding principles see for example Fine (2012, 59ff.), Schnieder (2011, 406f.), Correia (2013a, 44f.), and for discussion in the present context Roski (2018). Note that for the problem to arise, all the Humean has to postulate is that laws are sometimes partially grounded in what they explain. This arguably already follows from the idea of *Humean supervenience*, championed by David Lewis, according to which nomic facts arise from a 'mosaic' of particular, non-nomic facts (cf. Weatherson 2016, sec. 5).

216 For discussion of this problem see, e.g., Loewer (2012), Lange (2013b), and Roski (2018), as well as the latter's bibliography.

217 Note that, alternatively, the application of transitivity in deriving a (partial) self-explanation from (1) and (2) could also be blocked like this.

6.4 Empty-base *self*-explanation

Self-explanations promise to be *ultimate* explanations, i.e. explanations that end explanatory regresses and do not give rise to further why-questions. Explanations by status (and thus empty-base explanations) may play a similar role: They explain without involving reasons why that could give rise to further why-questions. Nevertheless, empty-base explanations are (generally) not self-explanations in the platitudinous sense. Still, the notion of an empty-base explanation can be used to characterize a particular kind of full self-explanation$_{\text{inclusive}}$ that is not a self-explanation$_{\text{restrictive}}$, namely that of an empty-base explanation whose explanatory link is identical to its explanatory result.[218] Schematically, such an 'empty-base self-explanation' has this form:

Base: $\varnothing$
Link: P
Result: P

In such an explanation, the result explains$_{\text{inclusive}}$ itself by being the link of its own empty-base explanation. Note that since there are no explanations without a link, self-explanations in the *restrictive* sense will likely involve a proposition that is distinct from its result, i.e. the explanatory link.[219] In contrast, an empty-base self-explanation would only involve one proposition, namely its explanatory result and link. Thus, in a sense, only an empty-base self-explanatory proposition would be *fully* self-explanatory in the sense of having an explanation with just it as a constituent, and only such explanations could be truly ultimate in that they do not involve any propositions that are unexplained or only explained by further explanations.

Before we consider candidates for empty-base self-explanations, let me address two arguments by Kovacs (2018, sec. 4) against the possibility of self-explanation that do not follow the pattern from section 6.1. In his first argument, Kovacs argues that just like circular ordinary arguments, circular explanatory arguments are objectionable, because just like ordinary arguments, explanatory arguments are supposed to provide reasons for their conclusions, but circular (ordinary as well as explanatory) arguments do not provide such reasons. Since Kovacs further assumes that every case of self-explanation corresponds to a circular explanatory argument, he concludes that self-explanation is objectionable.

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218 We could in principle also consider explanations whose link and result are identical, but whose base contains different propositions, but these would not be *full* self-explanations.

219 'Likely' since we could in principle consider explanations whose reason, link, and result are identical. I will set aside this issue for what follows.

In response note first that an explanation whose result and link are identical is structurally related to the notion of rule-circular justification: In such an explanation, an explanatory link (partially) explains itself. Therefore, the corresponding explanatory argument has a conclusion that corresponds to the explanatory rule that governs the argument.[220] Similarly, a rule-circular justification of an inference principle is provided by an argument to the conclusion that the principle in question holds (or perhaps to a conditional that corresponds to the inference principle), but which uses the inference principle in question to establish this.[221]

While some (e.g. Boghossian 2001) have endorsed the idea that rule-circular arguments may provide justification for their conclusions, their epistemic value is doubtful (for a recent criticism see Carter and Pritchard 2017). But note that even if the possibility of rule-circular *justification* is denied, the impossibility of empty-base self-explanation does not obviously follow: From the impossibility of rule-circular justification it would *prima facie* merely follow that if empty-base self-explanation is possible, then there are possible explanatory arguments that do not *justify* their conclusion, but they might still *explain* it.

Moreover, *pace* Kovacs, the premises of a good ordinary (or *epistemic*) argument *justify* its conclusion, viz. they are *epistemic* reasons for its conclusion, but the premises of a good explanatory argument *explain* its conclusion, they are reasons *why* the conclusion obtains. Kovacs appears to conflate these two notions of reasons and assumes that good explanatory arguments must justify (i.e. provide *epistemic* reasons for) their conclusions, but in many cases (e.g. many instances of inference to the best explanation), it is rather the case that a conclusion of an explanatory argument (i.e. an explanandum) justifies a premise of said argument (i.e. part of a corresponding explanans).

Kovacs' (2018, 1170) second argument turns on considerations about the relation between explanation and understanding:

> [For] a statement such as '*p* explains *q*' to express a genuine explanation, there should be a possible cognitive state of non-understanding, best expressed by the question 'Why *q*?', and an answer, '*p*', learning of which replaces this state of non-understanding with a state of understanding. To achieve this goal, explanations have to be informative in the sense that the explanans clause conveys information not provided by the explanandum clause, or at least conveys information in a way not provided by the explanandum clause. Note that this requirement doesn't mean

220 Cf. Litland's (2017) calculus for explanatory arguments.

221 The analogy is not perfect: The result of an empty-base self-explanation is a proposition that is identical to its link. In contrast, the conclusion of a rule-circular argument is a proposition stating that a certain inference principle (that, moreover, arguably is not a proposition) holds. Thanks to an anonymous commenter on the paper on which this chapter is based.

> that the explanans clause conveys information to every audience that the explanandum clause doesn't convey in the same way, only that it's capable of doing so in the right circumstances.

In the above paper, Kovacs wants to argue that self-grounding is impossible and he does so by first arguing that self-grounding would give rise to self-explanation and then providing arguments against self-explanation. Thus, the intended targets of this argument are, in our terminology, self-explanations in the restrictive sense. But the argument is not convincing:

First, recall chapter 1, the tripartite account of explanation and its connection to why-questions and because-sentences: The explanans of an explanation (properly understood) has two components: The base component which is comprised of reasons why the explanandum obtains and which can be used to answer corresponding why-questions, and the link component which connects base and explanandum. Given these assumptions, the proponent of self-explanation in the restrictive sense can grant that the explanans needs to convey information not provided by the explanandum clause '*P*', while maintaining that '*P*' (or rather '*P* because *P*') is a possibly correct answer to 'Why *P*?': The additional information conveyed by the explanans is then located in its link component, e.g. a proposition to the effect that [*P*] grounds [*P*].

Second, and supporting this point, observation of cases reveals that the step from a lack of understanding why towards understanding why often does not consist in coming to know the base-elements of the corresponding explanation why, but rather in coming to know (or to grasp) its link. For instance, many situations involving inference to the best explanation are like this: Sherlock may already know that the window is broken and that both Watson and Moriarty threw balls at the window, but coming to understand why the window broke involves grasping the causal (or law-like) link between Moriarty's throwing his ball and the window's breaking (see chapter 5 for more discussion).

While I am skeptical of self-explanation in the restrictive sense, Skiles (manuscript) has pointed out that Kovacs' argument might apply to explanations involving zero-grounding (and, we can add, empty-base explanations generally): Since the base of such explanations is empty, it does not contain any information that might lead to understanding. It seems then that Kovacs' argument would have us conclude that empty-base explanations are not possible. But again, empty-base explanations do involve another component, namely the link, grasping which can amount to understanding why the corresponding explanandum obtains. As argued in chapter 2, if we answer 'Why *P*?' with '*P* just because' or '*P* because' in the senses proposed there, we can communicate the relevant link.

Now, Kovacs' information constraint on explanation is more problematic for the notion of empty-base self-explanation, with which we are concerned here, because

such explanations have an empty base (so there is no information to be found there), while the explanandum and the link are identical. Thus, neither base nor link provide information beyond the explanandum. In response, recall that in chapter 1 I have argued that mere knowledge of an explanatory link (plus base) need not be sufficient for understanding why the corresponding explanandum obtains. Rather, a mental state of grasping the link plus some associated cognitive control over the relationship is required. If this is correct, then there can be a possible cognitive state of non-understanding why *P* that is compatible with knowledge of [*P*] and [*P*] being the link and result of an empty-base self-explanation. For now, let us proceed to develop this notion further and look at candidates for empty-base self-explanations, I will say a bit more about this argument once we discuss generalized explanatory links below.

6.5 Candidates for empty-base self-explanations

Now, what would empty-base self-explanations look like? Recall the suggestion that explanatory links of empty-base explanations have the form '■*P*', where '■*P*' stands for the result of the corresponding empty-base explanation. Since explanatory links of empty-base self-explanations are identical to the result of their explanation, it follows from this that their links have the form '■*P*' and that the proposition [*P*] is identical to the proposition [*P*]. Call this the *formal criterion*.

Now the question is whether there can be propositions of this form. Using 'is *R*-related to' as a placeholder for relational predicates used to express explanatory links and 'is zero-*R*' as a placeholder for predicates used to express corresponding empty-base links. We can state the form of self-explanatory links as 'The proposition that *P* is zero-*R*', where the proposition expressed is identical with the proposition that *P*. Consider grounding as an example. Predicational zero-grounding statements have the form 'The proposition that *P* is zero-grounded'. Thus, if there are empty-base self-explanations of the grounding variety, the corresponding self-explanatory propositions have the form 'the proposition that *P* is zero-grounded', where the proposition that *P* is identical with the proposition that the proposition that *P* is zero-grounded. Indeed, here is a candidate that has this form:

(3) This proposition is zero-grounded.

Here, the expression 'This proposition' in (3) is intended to refer to the proposition expressed by (3). Note that while some propose that certain self-referential (e.g. paradoxical, liar-type) sentences do not express propositions, the self-referential nature of (3) alone is presumably not sufficient to assume that (3) expresses no proposition;

after all, many (apparently) unproblematic self-referential sentences exist.[222] But now note how (3) resembles the truth-teller 'This sentence is true': If we had to speculate about the truth-value of (3), it would not seem unreasonable to assign it the same truth-value as the truth-teller, which, many are inclined to believe, is defective and neither true nor false.[223] And even if (3) were true, it presumably could not fulfill the high hopes some philosophers have put into self-explanatory propositions: Intuitively, (3) is somewhat thin in content, which is, perhaps, exactly what is to be expected of a zero-grounded proposition. Consequently, it is hard to see how it could serve the idea that a substantial class of truths are eventually explained by self-explanatory propositions.

One might perhaps think that instances of the following schema could do better in this regard (let '*P*' stand for an arbitrary proposition and '*4*' express the proposition labeled by '(4)'):

(4) The proposition that (*P* and *4*) is zero-grounded.

But this is problematic because (4) seems to fail the formal criterion: If we eliminate the zero-grounding operator from (4), we obtain '*P* and *4*', which does not seem to be identical with (4), in part because (4) expresses a proposition with a zero-grounding operator having largest scope, whereas in '*P* and *4*', the conjunction operator has largest scope. We could perhaps allow that *some* conjunctions are identical (or at least suitably equivalent) to one of their conjuncts, this is for example possible according to certain worldly modes of identifying propositions or facts (e.g. Correia 2016). Then to vindicate the possibility of self-explanations of the above form, one would have to find a mode of individuation suited to deliver instances of (4) satisfying the formal criterion, but such an investigation goes beyond the scope of this chapter.

222 E.g. 'This proposition is a proposition', 'Every proposition is a proposition' and 'This proposition is such that 1+1=2'. Cf. Rosenkranz and Sarkohi (2006). As an anonymous commenter on the paper on which this chapter is based has stressed, it could be thought that the candidates considered here and in the next subsection would amount to *objectionably* ill-founded propositions. Development of a theory of propositions that would vindicate the existence of the candidates would go beyond the scope of this book, but let me note that the candidates are not obviously defective in this way and that at least with respect to (3), I am not alone in this assessment, cf. Lovett (2020). One reservation here might stem from an understanding of propositions as mereological wholes, but first this understanding is not mandatory, and second see Kearns (2011) for an argument that on such a view we should simply accept that at least certain (otherwise unproblematic) self-referential propositions are parts of themselves. For an investigation into the non-well-founded mereology required for this, see Cotnoir and Bacon (2012).

223 Cf. Field (2008), but note also Field (2008, 277).

Instead, here are three further options to find (perhaps more substantial) candidates for empty-base self-explanations: First, one could attempt to find an explanatory relation *R* such that 'This fact is zero-*R*' is more substantial and less like the truth-teller than (3). The second option invokes Dasgupta's (2014a) proposal that grounding is irreducibly plural, and the third considers laws as explanatory links.[224] Setting aside the first option, we will now look at the second and third options in turn.

6.5.1 Irreducibly plural grounding

According to Dasgupta (2014a), grounding is irreducibly plural in the following sense: (predicational) grounding statements have the form 'The *Y*s are grounded in the *X*s', where '*Y*' and '*X*' are schema-letters for expressions denoting pluralities of facts, and it is possible that the *Y*s are grounded in the *X*s, without any of the *Y*s on its own being grounded in the *X*s. For example, Dasgupta argues that the individualistic facts (i.e. facts concerning particular individuals, like [Socrates is a philosopher] or [Obama is 75 kgs]) are together irreducibly plurally grounded in purely qualitative facts. That is, for example, individualistic facts about the mass of particular individuals are plurally grounded in purely qualitative facts capturing the mass relations between things, but no single fact about the mass of a particular individual is grounded in such facts on its own.

Correspondingly, plural zero-grounding statements can be expressed by having '*X*' denote an empty plurality; alternatively, 'The *Y*s are zero-grounded' can be used. Dasgupta's proposal then allows for more contentful candidates for empty-base self-explanation by allowing for a plurality of propositions to occur as (joint) groundees in a grounding statement like this:

(5) This fact, [*P*] are zero-grounded.

Here, 'This fact' refers to the fact expressed by (5). Assuming with Dasgupta that there are irreducibly plural instances of grounding, an instance of (5) might in principle obtain without it being singularly zero-grounded, while at the same time being plurally zero-grounded together with [*P*].

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224 A fourth option could perhaps be this: Returning to the assumption that links of empty-base explanations have the form '■*P*', one might consider the possibility of prefixing a right-side infinite sequence of '■*P*'s to a sentence '*P*' like this: '■■■ ... *P*'. Here, when the outermost '■' is eliminated, arguably, a sentence of the same form '■■■ ... *P*' remains; but to my knowledge, a theory of non-well-founded propositions like this would yet have to be motivated and developed.

Now, is there any reason to assume there being self-explanatory facts of the form of (5)? What kind of facts would be suitable to be collectively zero-grounded, where one of the collectively zero-grounded facts is the corresponding collective zero-grounding fact itself? Dasgupta's examples for collectively grounded facts all involve facts that are similar in some respect (like the individualistic facts).

Therefore, a natural candidate for our collectively zero-grounded facts are other (non-factive) grounding facts. According to this idea, all non-factive grounding facts would be irreducibly collectively zero-grounded, including this collective non-factive grounding fact itself. One tentative advantage this proposal has over Litland's (2017) original proposal (according to which non-factive grounding facts are zero-grounded) is that it avoids the following somewhat awkward regress: According to Litland's proposal, $[P \rightarrow Q]$ is zero-grounded, $[[P \rightarrow Q]$ is zero-grounded] is zero-grounded, $[[[P \rightarrow Q]$ is zero-grounded] is zero-grounded], etc.; according to the present proposal there is just one self-referential collective zero-grounding fact here.[225]

6.5.2 Generalized explanatory links

Let us finally consider how generalized links, such as laws of the following form might help (let '$\Box_L$' stand for a law operator like the metaphysical law operator):

(LAW) $\Box_L \forall x(Fx \rightarrow Gx)$

The idea is this: An ordinary generalized explanatory link can serve as an explanatory link of many explanations by linking different bases with different results. A generalized link of an empty-base explanation could in turn figure in explanations with several different results. Thus, in principle, there might be such a link which is the result of an empty-base explanation and which thus explains itself, but which in addition is the link of a further (possibly empty-base) explanation with a different result. Incidentally, the idea is reminiscent of Nozick's idea of "explanatory self-subsumption":

225 If one considers this regress to be more problematic than merely somewhat awkward, one might additionally reason as follows. What the regress shows is that some explanatory work remains to be done at each step and is hence deferred ad infinitum. Hence, a non-factive grounding fact cannot be fully zero-grounded *on its own*. But given the present idea, Litland's proposal can be amended: Non-factive grounding facts might not be individually zero-grounded, but they are all collectively zero-grounded.

> The objectionable examples of explanatory self-deduction (total or partial) involve deductions that proceed via the propositional calculus. Would the explanation of a law be illegitimate automatically if instead the law was deduced from itself via quantification theory, as an instance of itself? If explanation is subsumption under a law, why may not a law be subsumed under itself? (Nozick 1981, 119ff.)

Here, Nozick appears to suggest that the permissibility of self-explanation somehow depends on whether the involved explanatory steps correspond to rules of the predicational calculus as opposed to the propositional calculus, but this does not seem very convincing: Just consider the question of whether universal generalizations are grounded in their instances or whether they ground their instances: While both options *may* have some initial plausibility, we should not accept both on pain of violating the asymmetry of grounding.

But we can ignore this part of Nozick's suggestion, and then the above considerations about empty-base self-explanation can help capture his idea of a self-subsuming explanatory law. Nozick (1981, 119) does not properly distinguish between the roles of explanatory link and base; for example, he takes a self-subsuming principle to be an (explanatory) reason of itself. But if we make the distinction and understand explanatory self-subsumption as a kind of empty-base self-explanation, we can explain why explanatory self-subsumption may seem possible, namely because the simple arguments against self-explanation then do not apply to it. Moreover, the idea of explanatory self-subsumption gives us a further resource to address Kovacs' second argument: Someone who knows a self-subsuming explanatory principle might not have grasped it fully and thus might not have realized that it is self-subsuming. Thus, such a person may wonder why the self-subsuming principle obtains. To understand why the principle obtains, this person then need not obtain further information, rather they need to grasp that the principle is self-subsuming and can thus take them from the empty base of reasons to the principle itself.

Let us think a little about the form self-explaining links à la Nozick would have to take. Let us consider unconditional links involving both quantification over entities and into sentence position. We can furthermore consider ordinary quantification or quantification into sentence position. Empty-base law-like links could then for example have one of the following forms (let '*O*' schematically stand for a sentential operator):

(L1) $\Box_L \forall x(Gx)$
(L2) $\Box_L \forall p(Op)$

It is unclear to me whether there could be an instance of (L1) that satisfies the formal criterion, i.e. an instance such that one of the instances of the involved

quantification is identical to the proposition that is the whole link.[226] But consider (L2): Could there be an instance for '*O*' and a proposition [*P*] such that the proposition $\Box_L[\forall p(Op)]$ is identical to the proposition [*OP*]? Well, such instances are provided by the $\Box_L$-operator and the proposition $[\forall p(\Box_L p)]$:

(L3) $\Box_L \forall p(\Box_L p)$

If the quantifier is understood as ranging over all propositions, the result is absurd because for no false proposition [*P*] is it the case that $\Box_L P$. This problem can be avoided if we instead understand the quantifier as ranging over all *facts*. The result is a candidate explanatory link according to which every fact is a law. While this will strike many as only marginally more plausible, the result is still interesting: Some philosophers have been moved to admit self-explanatory facts by their acceptance of the PSR. The PSR has also moved some to endorse necessitarianism, the idea that every fact is necessarily the case.[227] (L3), properly understood, embodies these two rationalist ideas: It is self-explanatory and it states a variant of necessitarianism according to which every fact is a law.[228]

Let us take stock: While it is unclear whether there are more plausible candidates for empty-base self-explanation, we have made progress towards answering whether empty-base self-explanation is possible by clarifying what it would take for them to exist. If we are pessimistic about the prospects of empty-base self-explanation, we have at least gained a better understanding of why this kind of self-explanation does not exist: Not because 'explains$_{\text{inclusive}}$' is irreflexive, as the arguments of section 6.2 would have it, but because it is hard to find substantial and plausible propositions of the required form.

226 If we assume, e.g., that [*P*] and [[*P*] is the case] to be identical, then '$_L\forall x(x$ is the case$)$' is an instance of (L1) that satisfies the criterion, but this example faces similar issues to those discussed below. The issue here is to find an instance that satisfies the formal criterion without being too implausible.

227 Spinoza is an example for both moves, cf. Della Rocca (2010) and Lærke (2011), but see Schnieder and Steinberg (2015) on how proponents of the PSR can avoid either consequence.

228 One idea worth considering might be to restrict the quantifier in (L3) such that it still ranges over (L3) itself, but does not range over all facts, thereby avoiding the consequence that every fact is a law.

6.6 Empty-base self-explanation meets philosophical theology

Let me end the chapter by showing how the notions of empty-base explanation and empty-base self-explanations might inform our understanding of certain ideas about the explanation of the existence of God. According to many scholastics like Aquinas, but also according to some later philosophers like Spinoza, God's essence involves God's existence.[229] This alone suggests a way in which God's existence might be explained, namely by its status as being part of the essence of God. Using the conceptual apparatus developed above, the idea can be put like this: God's existence is empty-base explained, and the explanatory link of this explanation is the fact that it is part of God's essence that God exists.

Now, both Aquinas and Spinoza go further in that they also believe that God's existence is *identical* to God's essence.[230] But this provides the material for a proposal for an empty-base self-explanation of God's existence: God's essence, i.e. the fact that it is part of God's essence that God exists, would be the empty-base link of this explanation and God's existence would be the explanatory result of this explanation. But according to both Aquinas and Spinoza, God's essence *just is* God's existence. If we understand this identity as the identity between the fact that God exists and the fact that it is part of God's essence that God exists, then the result is a proposal for an empty-base self-explanation.

Some remarks: First, by understanding their proposal as concerning empty-base self-explanations, both Aquinas and Spinoza might avoid the arguments against the intelligibility of self-explanation, as I have argued above. Second, the proposal is confronted with an issue we have encountered already: It is unclear that the required claim concerning the identity between the explanandum and the explanatory link can be made sense of. Third, while Aquinas' and Spinoza's shared assumptions allow for a proposal for a self-explanation of God's existence without the need to claim that God's existence is its own reason why (e.g. its own ground or cause), Spinoza appears to explicitly want to claim that God is her own cause, i.e. a *causa sui* and thus reason why.[231]

229 Lærke (2011, 447f.).
230 Cf. McInerny and O'Callaghan (2018, sec. 11.3) for Aquinas and Lærke (2011, 456) for Spinoza.
231 Cf. Lærke (2011).

6.7 Conclusion

Let us recapitulate: Using the tripartite account of the structure of explanations, I have distinguished two notions of self-explanation, defended one against several arguments against the possibility of self-explanation, and applied it in a solution of the circularity problem for Humeanism about laws of nature. In the remainder of the chapter, I have developed and defended the notion of an empty-base self-explanation and suggested some applications for it.

7 The Epistemology of Empty-Base Explanation

The topic of this chapter is the epistemology of empty-base explanation. In the literature on zero-grounding (which provides one kind of empty-base explanation), several methods and kinds of arguments to establish instances of zero-grounding can be found (rather than being completely distinct, some of these overlap to an extent):

1. Extrapolation and application of general principles of grounding to the limiting cases with zero grounds.

As we have seen earlier, Fine (2012) takes a general principle of grounding and observes that the principle has a limiting instance which corresponds to an instance of zero-grounding, in Fine's case the zero-grounding of the empty conjunction.

2. Deriving instances of zero-ground within an explanatory calculus.

Litland (2017) argues for a calculus of explanatory inference rules and shows that given this calculus, the zero-grounding of non-factive grounding claims can be established.

3. Arguing both that a given proposition is grounded and possesses no grounds.

Muñoz (2020) argues for the (contingent) zero-grounding of negative existential facts by first arguing that negative existential facts cannot have grounds and then arguing that they must be grounded, leaving their being zero-grounded as the only option.

From the previous chapters, we can furthermore extract the following approaches:

4. Arguing first that a given (kind of) proposition has a certain kind of explanation and then arguing that this explanation is zero-ground (or more generally empty-base) explanation.

If we can argue that a given proposition has an explanation by status (for example, in the case of essentialist explanation, this idea seems to be backed by intuition), then given that I have argued in chapter 3 that such explanations should be understood as empty-base explanations, this amounts to an argument for an instance of the latter. Relatedly, in chapter 4 I have relied on a mix of intuition and theoretical considerations to argue that logical theorems possess a special

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kind of explanation that outstrips their ordinary grounding explanations, and then I have argued that either zero-grounding or other empty-base explanations provide such an explanation.

5. Using the notion of zero-ground together with the familiar (mixture of) philosophical methods of conceptual analysis, Carnapian explication, and abductive theorizing.

What I have done in chapters 3, 4, and 6 is an instance of this kind of general methodology. A further example is provided by De Rizzo (2020), who uses zero-ground to give an account of the grounds of necessities. Moreover, presumably, the other methods will have to be accompanied by a mixture of familiar philosophical methods as well: As Rodriguez-Pereyra, Lo, and Skiles (manuscript) argue, the extension of familiar grounding principles to edge cases may yield a set of extended principles which together are inconsistent. In such a case, abduction or considerations concerning theoretical usefulness may help.[232]

More generally, we can observe that empty-base explanation is a type of explanation, and that the involved explanatory notions are the same notions that also figure in ordinary cases of explanation. For example, these are grounding in the case of zero-grounding explanations and laws of nature in the case of empty-base explanation involving a law of nature as link. Therefore, it is to be expected that the epistemology of empty-base explanation is an extension or part of the epistemology of ordinary explanations. Thus, however we can come to know ordinary grounding explanations presumably is also (or at least closely related to) how we can come to know zero-grounding explanations. Indeed, the methods mentioned above conform to this idea.

In this chapter I will focus on the epistemology of grounding explanations. Not much has been written explicitly about the epistemology of grounding and grounding explanations specifically, and I will take some steps towards remedying this situation. The goal is to explore the prospects of an account of how inference to the best explanation can establish grounding explanations. Some assumptions concerning inference to the best explanation will be developed that show how it might be used to establish empty-base explanations in general and zero-grounding explanations in particular. Of course, there may well be other (basic) methods of acquiring knowledge of grounding facts, but in the following I want to focus on inference to the best explanation.

This is the plan for the chapter: In section 7.1, to approach the use of inference to the best explanation (IBE) in a metaphysical context, I present and develop Stephen Biggs' account of how IBE can provide knowledge of metaphysical modalities on the

232 Thanks to Jonas Werner for discussion here.

basis of non-modal propositions, and formulate a dilemma for the account. In section 7.2 I argue that the problem raised by the dilemma for an abductive epistemology of metaphysical modality can be avoided by an abductive epistemology for explanatory notions such as grounding. I take some steps towards a theory of how inference to the best explanation can establish grounding claims on the basis of metaphysically innocuous, e.g. empirical claims. In section 7.3 I discuss how inference to the best explanation might establish identities and what a unified account of inference to the best explanation that can establish both grounding claims and identities might look like. In section 7.4 I make some suggestions as to how to flesh out and develop the account further, and I discuss the application of IBE vis-à-vis the PSR and a distinctive problem that arises for IBE given the existence of empty-base explanation.

7.1 Abductive modal epistemology and a dilemma for Biggs' account

Stephen Biggs (2011) has argued that IBE can be used to establish metaphysical necessities on the basis of non-modal premises.[233] At the core of his proposal lies the assumption that metaphysical necessities, such as [$\Box\forall x$ is scarlet $\rightarrow$ x is red], sometimes provide the best explanation for their non-modal counterparts, in this case [$\forall x$ is scarlet $\rightarrow$ x is red]. I argue that the account fails because the relevant necessities cannot explain their non-modal counterparts. Instead, I suggest that IBE might play a fruitful role in the epistemology of *explanatory* metaphysical notions such as grounding.

While philosophers have sometimes offered abductive considerations in modal metaphysics, few accounts of this practice exist in the literature on the epistemology of modality. Some applications and discussions of abductive considerations in modal metaphysics can be found in Lewis (1986b), Block and Stalnaker (1999), Hill and McLaughlin (1999), Shalkowski (2010), Hale (2013) and Williamson (2013). Some of the literature on the question of why there is anything at all can also be considered to be employing abduction to infer necessities from non-modal premises, e.g. see Rundle (2004). Relatedly, Rayo (2013) and Greco (2015) suggest that abduction might establish 'just is'-statements on the basis of non-modal premises, and Fine (2001) suggests that IBE might be used to establish grounding facts, but he does not develop the idea. One notable exception to this shortcoming is Biggs' (2011) "Abduction and Modality",

233 A comment on terminology: As I use the term, 'metaphysical necessity' refers to claims, propositions or facts of the form '$\Box P$', where 'P' stands for an arbitrary proposition and '$\Box$' expresses metaphysical necessity, as customary.

which contains an account of how IBE can establish metaphysical necessities, such as [$\Box\forall x(x$ is scarlet $\rightarrow x$ is red)], using non-modal premises, such as [$\forall x(x$ is scarlet $\rightarrow x$ is red). Crucially, the account relies on the assumption that the relevant necessities can explain their non-modal counterparts.

I will now provide a sketch of Biggs' proposal and some questions it is confronted with. Under its alternative name 'abduction', Biggs characterizes IBE as follows:

> Abduction can be thought of as consisting of three steps. First, identify a phenomenon that requires explanation. Second, generate theories that would explain the phenomenon. Third, choose the theory that best explains the phenomenon. Abduction, then, involves three main elements: the phenomenon to be explained (i.e. the explanandum), the competing theories qua explanations (i.e. the potential [explanantia]), and the principles for ranking theories. (Biggs 2011, 293)[234]

In accordance with this schema, Biggs proposes that metaphysical necessities can, in a nutshell, be established on the basis of non-modal premises along the following steps:

1. Identify non-modal explananda of the form '$\forall x(Fx \rightarrow Gx)$', such as:

   (RED) $\forall x(x$ is scarlet $\rightarrow x$ is red$)$
   (WATER) $\forall x(x$is a quantity of $H_2O \rightarrow x$ is a quantity of water$)$

2. Generate salient candidate explanantia. These come in the following forms:

   (NOMOLOGICAL) $\Box_N\forall x(Fx \rightarrow Gx)$
   (METAPHYSICAL) $\Box_M\forall x(Fx \rightarrow Gx)$
   (IDENTITY) Being F = being G

3. Considerations of parsimony rank the candidate explanantia: Provided that all three candidates are compatible with the non-modal evidence, the relevant instance of IDENTITY is best. Provided that this candidate explanans is excluded by the non-modal evidence (for example in the case of RED provided by things that are crimson in color), the relevant instance of METAPHYSICAL is best. Inference to the best explanation allows us to infer the best candidate explanandum, for example [Being a quantity of water = being a quantity of H_2O] in case the explanans is WATER and [$\Box_M\forall x(x$ is scarlet $\rightarrow x$ is red)] in case it is RED.

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234 A comment on terminology: Sometimes, it appears, 'abduction' is used in a sense in which it includes inferences on the basis of theoretical virtues such as simplicity and strength without any involvement of explanation (that is, at least not with any obvious or explicit such involvement). Biggs and I on the other hand are (at least initially) only concerned with IBE as characterized in the quote above. For a more thorough characterization of IBE see Lipton (2004).

Before I set up the dilemma for the assumption that the relevant instances of METAPHYSICAL are candidate explanantia for propositions such as RED and WATER, two comments are in order: First, I will postpone discussion of the case of IDENTITY until section 7.3. Second, Biggs' account raises a number of questions that his discussion leaves open, some of which are: (1) Can any arbitrary universally quantified conditional figure as a premise of an abductive argument as sketched above? (2) Is there a way to differentiate those that can from those that cannot? What kind of consideration allows to rank instances of NOMOLOGICAL higher than instances of METAPHYSICAL or IDENTITY? (3) What consideration guards against inferring necessities from contingent universal generalizations?

These questions need to be satisfactorily answered, not least to be confident that the sketched method does not objectionably overgenerate necessities; until then, the account remains incomplete. Biggs (2011, 312, fn. 26) seems confident that these questions can be answered using some ideas concerning theory choice from Lewis (1986b), but he does not provide details. We will come back to these questions in section 7.4, but for now, we turn our attention to a more fundamental flaw than incompleteness that Biggs' account suffers from: The alleged candidate explanantia are none, or so I will argue.

To set up the dilemma that confronts Biggs' account, I have to introduce a few assumptions about explanation and IBE. First, IBE deals with explanation why; the explanations that are considered and inferred in applications of IBE are explanations why a certain thing is the case and not, e.g., explanations how something is done or what something is.[235] Accordingly, we will only be concerned with explanation why in what follows. Second, recall from chapter 1 the tripartite account of explanation according to which explanations involve claims, propositions, or facts in the roles of explanatory sources (comprising the explanation's base), link, and result. The tripartite account raises the question of how the traditional (and Biggs') explication of IBE as an inference from an explanandum to its best candidate explanans should be recast in terms of base, link, and result. While 'result' can simply replace 'explanandum' in the characterization, matters are less clear with 'base' and 'link' on the one hand and 'explanans' on the other. The salient questions are whether IBE is an inference from an explanatory result to

- . . . the base of the best candidate explanation,
- . . . the link of the best candidate explanation,
- . . . the base and the link of the best candidate explanation,

235 It is an interesting question whether this assumption is indeed correct (i.e. whether there could for example be something like inference to the best explanation *what* something is), but this is a question for a different occasion. In any case, the standard examples of IBE deal with explanation why.

– . . . sometimes the base, sometimes the link of the best candidate explanation, and sometimes both.

Examples of the first type come to mind most readily. For example, Lipton introduces IBE using the following examples:

> Faced with tracks in the snow of a certain peculiar shape, I infer that a person on snowshoes has recently passed this way. There are other possibilities, but I make this inference because it provides the best explanation of what I see. Watching me pull my hand away from the stove, you infer that I am in pain, because this is the best explanation of my excited behavior. Having observed the motion of Uranus, the scientist infers that there is another hitherto unobserved planet with a particular mass and orbit, since that is the best explanation of Uranus's path. (Lipton 2004, 1)

But it seems plausible that IBE can also be used to infer the link of the best relevant explanation: Since explanations consist of both a base and a link, inferences to the best explanation should accordingly be able to license an inference to both a base and a link. And indeed it seems that, for instance, from the fact that the window is broken, Sherlock may not only abductively infer that Moriarty threw a ball at it, but also that the window is broken *because* Moriarty threw a ball at it and that Moriarty's throwing the ball caused the window to break.

Moreover, consider the toy-case of a wooden box to which a switch and a lightbulb are attached; the latter lights up when the former is pressed. Given suitable background assumptions, IBE seems to license to infer from this description of the situation that pressing the switch causes the lightbulb to light up. This already supports the assumption that IBE can establish the link of an explanation (here the causal link between the pressing of the switch and the lighting of the bulb) from a description of the result (the lighting of the bulb) and a base (consisting in the pressing of the button) of an explanation. Note that (again given suitable background assumptions) IBE appears to license inferring certain explanatory links over others in the described situation: Inference of a simple causal mechanism (perhaps the presence of a simple electric circuit that is closed by the push of a button) seems licensed over inference of more complex causal mechanisms (such as a miniature Rube Goldberg machine hidden in the wooden box).[236]

In addition to these cases, there are examples from the literature on IBE that support the point:

> But if we try instead to explain why Jones rather than Smith contracted paresis, we will be led [. . .] to look for some possibly relevant difference in the medical histories of the two

236 The example of the box with the lightbulb is not mine originally, but I cannot recall where I first encountered it.

> men. Thus we may infer that Jones's syphilis *was a cause of* his paresis, since this is an explanatory difference. (Lipton 2004, 73, my italics)

So I will assume that IBE can establish base alone, link alone or both together, depending on the case at hand. With respect to my case against Biggs' proposal this is fair since it provides a further option to understand the proposal. Additionally, we will see in the following sections that the assumption is theoretically fruitful when it comes to the epistemology of grounding.

With respect to Biggs' proposal now the question arises whether metaphysical necessities (more specifically: strict conditionals, possibly universally quantified) play the role of sources (constituting the base) or links in the abductive arguments suggested in his account. In what follows I argue that this question raises a dilemma for Biggs' account. According to the first horn, it is not sufficiently plausible that the relevant metaphysical necessities can figure in the bases of explanations like those suggested by Biggs: As I have argued in chapter 3, possibly ignoring some irrelevant exceptions, an instance of '$\Box\forall x(Fx \rightarrow Gx)$' is not a reason for the corresponding instance of '$\forall x(Fx \rightarrow Gx)$'.[237] According to the second horn, strict conditionals cannot be the links of any explanation at all and hence cannot occur in that capacity in abductive arguments.

First horn of the dilemma: instances of '$\Box\forall \boldsymbol{x}(\boldsymbol{Fx} \rightarrow \boldsymbol{Gx})$' do not normally occur as sources of explanations of the corresponding instances of '$\forall \boldsymbol{x}(\boldsymbol{Fx} \rightarrow \boldsymbol{Gx})$'.

The first horn of the dilemma consists in the fact argued for in chapter 3 that (with the possible exception of some extraordinary cases) for no [P], [$\Box P$] explains [P] in the sense of being a source in an explanation of [P]; or, in the idiom of reasons, (ignoring some extraordinary cases) for no [P], [$\Box P$] is a reason why [P]. Consequently, facts of the form '$\Box\forall x(Fx \rightarrow Gx)$' are not (ignoring the extraordinary cases again) reasons why/sources in explanations of the corresponding instances of '$\forall x(Fx \rightarrow Gx)$'. The relation that obtains between the sources and the result of an explanation can be expressed by a because-sentence. Thus, Biggs' account requires that because-statements like the following are true:

(BECAUSE-RED) $\forall x(x$ is scarlet $\rightarrow x$ is red) because $\Box\forall x(x$ is scarlet $\rightarrow x$ is red).

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237 To be clear, there are of course explanations with metaphysical necessities as sources (such as the partial explanation of my knowing that □P by it being that case that □P), the claim is merely that the explanations required by Biggs' account do not have metaphysical necessities as bases. On the other hand, as I have already argued in chapter 3, metaphysical necessities are never explanatory *links* due to their and explanation's nature.

In general, the account requires that there are true instances of the following schema:

(BECAUSE-□) *P* because □*P*.

But in chapter 3 I have argued against the relevant instances of BECAUSE-□, and suggested how to alternatively accommodate the intuitions in favor of those instances of BECAUSE-□. Moreover, if Biggs wanted to maintain the relevant instances of BECAUSE-□ he would have needed to provide an account of the explanatory link connecting [□*P*] and [*P*] (it cannot be grounding, as discussed in chapter 3) and, second, the resulting epistemological account (if combined with the thesis that we in fact sometimes come to know necessities as it describes), as well as the theories that are established along its lines carry commitment to the relevant explanatory links, avoiding which would be preferable.[238]

Second horn of the dilemma: strict conditionals cannot be explanatory links.

The second horn of the dilemma states that strict conditionals cannot be explanatory links. Before I argue for this, note that even if a strict conditional such as [□∀*x*(*x* is scarlet → *x* is red)] could in principle figure as the explanatory link of an explanation, it is unclear how that explanation could have the form suggested by Biggs. This is because explanatory links are ordinarily thought of as in some way connecting the base and result of an explanation, and there does not appear to be a candidate explanatory base that [□∀*x*(*x* is scarlet → *x* is red)] connects like this with [∀*x*(*x* is scarlet → *x* is red)]. This problem can be solved by assuming that IBE can take the following form:

1. Instead of starting with a candidate explanandum (or explanatory result) of form '∀*x*(*Fx* → *Gx*)', we start with a true instance of '*Gx*', i.e. a true instance of '*x* is red' such as [*a* is red].
2. We come up with candidate explanations of this explanandum, with an explanatory source that may well be antecedently known, for example: [*a* is scarlet].[239]

238 Note that even if the proposal from appendix B of chapter 3 could be made to work, it is unclear how this could help Biggs' cause: A way would have to be found that allows to weigh instances of '□*P*' against instances of '*P*' in abductive arguments. Biggs offers nothing in this regard, he does not even consider instances of '*P*' as explanatory candidates. Without such an account though, it remains unclear whether IBE could ever establish an instance of '□*P*' over an instance of '*P*'.

239 There may be other candidate sources such as [*a* is crimson], but at least this option is excluded by our knowledge of [*a* is scarlet].

. . . and an explanatory link such as

(METAPHYSICAL) $\Box_M \forall x(x \text{ is scarlet} \rightarrow x \text{ is red})$.

3. The candidate explanations are ranked and if everything goes well, METAPHYSICAL might be inferred as the explanatory link of the best explanation for [*a* is red].

The wooden box example from above supports the point that IBE can indeed proceed in this fashion from a candidate explanandum to an explanation whose base is already known, thus only providing additional knowledge of an explanatory link. Biggs' proposal thus conceived would have two advantages over the version discussed before: First, it would carry no problematic commitment to additional explanatory relations. Second, one might have suspected from the beginning that the explanatory proposals that philosophers of mind such as Block and Stalnaker had in mind when discussing IBE to establish necessities concerned explaining why certain mental states obtain in terms of physical states. If the relevant explanatory proposals are indeed of this form, then it is somewhat natural to suspect that the strict conditionals that connect physical states with mental states are explanatory links for the relevant explanatory proposals.

Alas, the point that constitutes the second horn of the dilemma is that there are well-known reasons against the thesis that metaphysical necessity is an explanatory notion and thus against the thesis that strict conditionals can be explanatory links (this is often put in relational terms: The relation expressed by a strict conditional is not an explanatory one).[240] Two such reasons are these: First, explanatory links are asymmetric, but modal dependence (as captured by strict conditionals) is not. Note that while some authors accept that there are instances of symmetric explanation, modal dependence has many symmetric instances where intuitively there is either no explanatory connection to be found, or it does not run in both directions.[241] For example, modal dependence is reflexive, but explanation is not (even if we allow for some exceptional facts to be self-explanatory). Also consider the following two cases: It is plausible that [snow is white] is true because snow is white and not vice versa. But [snow is white] and [[snow is white] is true] are modally equivalent. Furthermore, any two necessary truths are modally equivalent, but neither need explain nor be a reason for the other.

240 I recap here my discussion from section 3.5.

241 For discussion of symmetric instances of dependence and grounding, see for example Jenkins (2011), Barnes (2012), and Thompson (2016).

This last case gets us to the second point against strict conditionals as explanatory links: Explanatory links only connect explanatorily relevant relata, but strict conditionals also connect explanatorily irrelevant relata: Each proposition necessitates *any* necessary proposition, even if the former does not explain the latter. Also, if [P] and [Q] are necessary and [R] is contingent, then [$P \wedge R$] and [$Q \wedge R$] are contingent, but necessarily equivalent and no explanatory connection seems to hold between them, at least if [P] and [Q] are explanatorily unconnected.

Biggs might propose a two-component view according to which what should be taken as the explanatory link is a strict conditional together with a further element that ensures that the two conditions above are satisfied. Here are some remarks on this view: First, I do not know of any such account in the literature, so the onus would be on the friend of strict conditionals as explanatory links to develop such a view. Second, taking a clue from Kim (1994), we may believe that explanatory links should somehow account for features of explanation such as irreflexivity, asymmetry, and relevance. *Prima facie*, the proposed two-component view does a worse because less unifying job at this than views that propose explanatory relations like causation or grounding that natively satisfy conditions such as asymmetry and relevance. Third, we might allow for such proposed sub-par explanatory links in the candidate explanations considered in an application for IBE, but it becomes unclear why they should ever be preferred to more unified candidate explanations using notions such as ground.

This completes the dilemma against Biggs' account: In chapter 3 and above I argued first that it is not sufficiently plausible that instances of '$\Box\forall x(Fx \rightarrow Gx)$' are explanatory sources or reasons for the corresponding instances of '$\forall x(Fx \rightarrow Gx)$' and then I argued that instances of '$\Box\forall x(Fx \rightarrow Gx)$' are never explanatory links. But since, as argued above, Biggs' proposal is committed to them either being links or explanatory sources of the right sort, we should discard his proposal.

7.2 Towards an abductive epistemology for grounding

Strict conditionals cannot be the links of any explanation and thus cannot be established by IBE in the way sketched in section 7.1, but truths involving explanatory metaphysical notions that can be explanatory links may well be established in this way. One such notion is grounding, as discussed for example in Fine (2012).[242] Adopting the form of argument proposed at the end of the last section, an application of IBE that establishes a grounding claim could look like this:

242 Incidentally, some authors have suggested (but not developed that suggestion) that grounding might be abductively established, e.g. Fine (2001) and Schaffer (2017).

1. Instead of a candidate explanandum (or explanatory result) of form '$\forall x(Fx \rightarrow Gx)$' we start with a true instance of 'Gx', i.e. a true instance of 'x is red' such as [a is red].
2. We come up with candidate explanations of this explanandum, with an explanatory source such as [a is scarlet].

   . . . and the following explanatory link:

   (GROUNDING) [a is scarlet] grounds [a is red].

   Note that there might be further candidate explanatory links, such as:

   (NOMEX) [a is scarlet] nomologically explains [a is red].

3. The candidate explanations are ranked and if everything goes well, GROUNDING might be inferred as the explanatory link of the best explanation for [a is red].

Note that the sketched proposal does not rely on the use of grounding specifically – instances of any notion that can provide links of metaphysical explanations may in principle be established by an argument like this: Two examples that come to mind are metaphysical laws and perhaps some sort of essential dependence. Note as a possible further avenue of investigation that abduction might also take a somewhat different form: First, a form of abduction could be considered that starts with an explanatory base and a result, and just compares possible links.[243] In contrast, the abduction above compares bases and links together. Second, a form of abduction could be considered that takes several instances of, i.e. 'x is red' and 'x is scarlet' as its starting points from which a metaphysical law or a plurality of grounding statements is then inferred. Third, one could consider understanding abduction as theory choice guided by explanatory principles (amongst other principles, possibly). I will say a bit more about this option in what follows.

At this point there are good news and bad news for an abductive epistemology of metaphysical necessity. The good news is that an abductive epistemology of explanatory notions such as grounding may form the basis for an epistemology of metaphysical necessity: While not everyone in the literature agrees, grounding truths are commonly taken to entail corresponding metaphysical necessities. In order to arrive at an at least partially abductive epistemology of metaphysical necessity, the abductive argument in favor of the relevant grounding or essence claims might then be supplemented by a method that can establish the link between grounding claims and the corresponding metaphysical necessities.

243 Recall the wooden box example from above.

The bad news is that even if this link is a case of grounding, i.e. if the strict conditional is grounded in the grounding claim, it is of a form that the method sketched above cannot establish, because the method establishes an explanatory link based on the knowledge of an explanatory result (and potentially an explanatory base that also is known already). In this case, though, the explanatory result (the strict conditional) is not yet known and thus cannot serve as a premise of an abductive argument (at least not if abductive arguments are understood as I have done above). Even if we grant that IBE is able to establish grounding claims as suggested above, the method remains limited in a notable way with respect to metaphysical necessities. In metaphysics, interest in notions such as grounding is at least partially due to the idea that merely modal notions cannot capture certain explanatory features of the metaphysical phenomena. In our context, this feature of notions such as grounding in principle allows for IBE to provide epistemic access to these notions. Somewhat ironically, the stronger, explanatory notions may in principle be accessed by IBE, while metaphysical necessity requires different or at least supplementary methods.

Let me give an idea what these could be: Aside from a *sui generis* capability of assessing modal propositions (or related propositions such as counterfactuals), some live options are conceptual analysis, Carnapian explication, and abductive methodology understood more broadly as a kind of theory choice: If these methods deliver accounts of modal propositions in terms of explanatory ones, IBE as understood above could establish the latter, from which modal truths could then be derived using the aforementioned accounts.

Finally, turning to the epistemology of empty-base explanation, note that the above outline of how IBE might establish grounding statements is flexible enough to show how IBE might establish zero-grounding explanations: One of the explanatory candidates might be a zero-grounding explanation. IBE may then establish that candidate, if it turns out to be the best explanatory candidate that is available.

7.3 The case of identity

In the following sections I will try to refine and put some flesh on the bare bones of the proposal offered in the previous section. In this section let us consider whether the proposal can accommodate the idea that IBE is also able to establish identity statements: As in the case of metaphysical necessity, if an identity statement can be the conclusion of an instance of IBE, it has to either be the link of the corresponding explanation, or it has to figure in its base. More specifically, Biggs proposes that identity propositions such as [being a quantity of H_2O is identical with being a quantity of water] can sometimes be abductively inferred from

universally quantified biconditionals such as [$\forall x$(x is a quantity of $H_2O \leftrightarrow x$ is a quantity of water)]. For this to be true, [being a quantity of H_2O is identical with being a quantity of water] has to figure in the base or be the link of an explanation of [$\forall x$(x is a quantity of $H_2O \leftrightarrow x$ is a quantity of water)].

So, might [being a quantity of H_2O is identical with being a quantity of water] figure in the base of an explanation of [$\forall x$(x is a quantity of $H_2O \leftrightarrow x$ is a quantity of water)]? Or, in the idiom of reasons, might [being a quantity of H_2O is identical with being a quantity of water] be a reason [$\forall x$(x is a quantity of $H_2O \leftrightarrow x$ is a quantity of water)]? Although I am not completely unsympathetic, one reason to be skeptical here is that to understand the relevant explanations as grounding explanations would commit us to non-standard instances of grounding, while understanding it differently commits us to novel explanatory relations (recall here my discussion of the explanation of logical theorems from chapter 4).

To the thesis that identity statements can be the links of explanations one might object that they relate entities (broadly construed, including individuals, properties, facts, and propositions), while explanatory links are properly expressed using sentential operators.[244] But this objection would be insufficient for two reasons: First, while the operator view may well be correct for the case of grounding, this in itself does not suffice to show that all explanatory links are to be expressed using sentential operators – for example, perhaps causation is best understood as a relation between events. Second, as has been argued in the literature (e.g. by Rayo 2013), the notion of identity can be generalized to yield identity operators that apply to predicates and sentences, instead of merely to singular terms. Such a notion of generalized identity could then be used. But then it seems like the asymmetry-considerations from above apply here again: Explanatory links must be asymmetric, but identity statements are not, therefore identity statements cannot be explanatory links.[245]

Alternatively, we can try to invoke theoretical virtues such as ideological parsimony to argue in favor of generalized identity statements: A theory according to which being F just is being G is in this respect more ideologically parsimonious than a theory that does not identify them. While 'abduction' is sometimes used to refer to a general practice of theory choice on the basis of theoretical virtues such as parsimony, let us try to see whether we can understand the idea that identities can be established by abduction while understanding the latter as properly involving explanatory considerations as before.

244 As for example Fine (2012) proposes for the case of grounding.

245 Perhaps an asymmetric notion can be developed on the basis of generalized identity, but this is an idea that I will not pursue here.

So instead of going down either of the routes suggested above, I want to take a look at a method suggested by Rayo (2013) and developed by Greco (2015), that is related to IBE but somewhat more general, which may help to make sense of the idea of using something like IBE to establish identities. Rayo and Greco are concerned with the epistemology of 'just is'-statements, a kind of generalized identity statement. Instead of using IBE as understood above, they suggest an explanatory principle of theory choice which sometimes favors theories containing certain identity statements over other theories.[246] I will now quickly present the principle and offer some comments on it:

(Methodological Maxim)
In choosing between rival sets of 'just is'-statements, the more why-questions you can pose and answer, the better. The more why-questions you can pose but can't answer, the worse.

Note first that it might be possible to use this as a basis to develop a unified abductive account of the epistemology of 'just is'-statements and properly explanatory notions such as grounding. Of course, as with Biggs' proposal, more would have to be said about how the candidate answers to the relevant why-questions are to be ranked. Note also Greco's explanation of how the Methodological Maxim allows to decide between rival sets of 'just is'-statements:

> This double contrastivity of explanation – both in why questions, and in because answers – suggests a natural way of saying more about what sorts of costs and benefits are associated with accepting or rejecting a 'just is'-statement. In general, accepting a 'just is'-statement amounts to rejecting a distinction. On the doubly contrastive approach to explanation, distinctions (contrasts) are central to both questions, and answers. This will shed light on the sense in which rejecting or accepting a distinction has both costs and benefits. When we accept a new 'just is'-statement and thereby reject a distinction, we eliminate potential explanantia. We cannot explain anything by appeal to something's being *F* rather than *G*, once we accept that what it is to be *F* just is to be *G*. This is the cost side of the equation, and the sense in which accepting a 'just is'-statement involves a "decrease in the range of theoretical resources of one's disposal". But for essentially the same reason, rejecting a distinction also eliminates potentially pesky explananda. This is the benefit side of the equation – one cannot be under a burden to explain why something is *F* rather than *G* if what it is to be *F* just is to be *G*. (Greco 2015, 7)

But this account seems unsatisfactory because it cannot explain why the benefit of not being under a burden to explain why something is *F* rather than *G* counts in favor of the corresponding 'just is'-statement, rather than only in favor of the

246 In fact, Rayo and Greco are skeptical that their method ultimately succeeds, but this shall not concern us here.

ideologically cheaper corresponding universal biconditional [$\forall x(Fx \leftrightarrow Gx)$]. Let me explain: Once we accept that '*F*' and '*G*' are co-extensional, we have already removed the burden of explaining why something is *F* rather than *G*, because this question has as a presupposition that something is *F* and not *G*, but this presupposition is inconsistent with the assumption that everything is *F* iff it is *G*. Analogously, once we accept that everything is *F* iff it is *G*, we are already unable to explain anything by appeal to something's being *F* rather than *G*, because explaining thusly would require that we believe that there is something that is *F* and not *G*. Again, the consideration does not only apply to 'just is'-statements, but already to universally quantified biconditionals.

Therefore, let me propose a better account of the Methodological Maxim that does not rely on any considerations about contrastivity. We need to show how accepting 'just is'-statements affects how many why-questions we can pose and answer, even under the assumption that being *F* and being *G* are co-extensional. To do this, consider the following why-questions and because-answers:

1. Why is *F*?
2. Why is *G*?
3. *P* because *x* is *F*.
4. *P* because *x* is *G*.

If it is not the case that being *F* just is being *G*, then we deal with two distinct why-questions and two distinct because-answers here. But if being *F* *just is* being *G*, then a case can be made that in the relevant sense, 1. and 2. are the same why-question, and 3. and 4. are the same because-answer. After all, being *F* *just is* being *G*. Therefore there are prospects of an abductive epistemology of identity statements via the move to theory choice and explanatory maxims such as Greco's Methodological Maxim: 'Just is'-statements reduce the number of why-questions as well as the number of possible answers to why-questions.

It may be worth pointing out that a move like this does not without further ado provide an abductive epistemology for metaphysical necessities: Since why- and because-contexts are hyperintensional, the acceptance of mere co-intensionality – that metaphysical necessities can deliver – does not allow for a reduction in the number of why-questions and because-answers that one can offer: The notion of identity that is required for such a reduction needs to be strong enough that why-questions such as 1. and 2. are conflated if being *F* and being *G* are identical in the relevant sense.

Note that if this proposal works, the Methodological Maxim may provide the material to formulate an account of the theoretical virtue of ideological parsimony in explanatory terms: It may provide an answer to the question why a theory according to which being *F* and being *G* are identified and which is hence (in this respect)

more ideologically parsimonious than a similar theory according to which being *F* and being *G* are not identified, is to be preferred over the latter theory: Namely because the Methodological Maxim advises us to prefer the theory that gives rise to fewer unanswered why-questions.[247]

7.4 Fleshing out the account

Let us take a step back now and consider in what directions the above should be developed next. Note at the outset that there are at least two ways a proposal like the above can be understood: First, it can be understood as delivering an account of our judgments, intuitions, how they are justified, and what their underlying mechanisms are. A proposal with such an aim is for example given by Lipton (2004), who proposes IBE as an account of our scientific but also our ordinary, everyday life inferential practices. With respect to the present proposal, the idea would be that our intuitive judgments concerning grounding statements are due to and justified by an underlying application of IBE.[248]

Second, the present proposal can be understood as offering a method that can be reflectively applied to arrive at grounding statements. In order to offer such a method, the proposal needs to include specific enough instructions as to how to generate explanatory proposals, how to weigh competing explanatory proposals against each other and as to when we are in fact allowed to infer the best explanatory candidate. If we want to offer an account of the first kind, a similar account of how competing explanatory proposals are generated, weighted against each other, and finally inferred must be offered: Otherwise, it seems to me, we cannot be confident that our intuitions are indeed the result of a weighing of explanatory proposals. So, there are some open questions that an account of IBE that is able to establish grounding claims – whether the account proposes IBE as a method that can be reflectively applied or as an account for our intuitive judgments – needs to answer. Such questions include:

247 Let me mention one problem that further development of these ideas would have to address: There is some intuitive support for the idea that (assuming the identity of water and H_2O) we should accept that *x* is water because *x* is H_2O and still reject that *x* is water (or H_2O for that matter) because *x* is water (for discussion see Schnieder 2010). The approach either has to either reject this, or develop a notion of generalized identity and a criterion of identity of why-question s and because-answers that avoids the problem.

248 In this case, one may wonder whether the account would be phenomenologically adequate.

1. How can the explanatory candidates be determined and how can we know what the explanatory candidates are?
2. How can the *best* explanatory candidate be determined and how can we know what the *best* explanatory candidate is?
3. What constrains the application of IBE such that sometimes none of the explanatory candidates can be inferred?

These are also questions that a general account of IBE should address, but they nevertheless generate additional pressure for an abductive epistemology of grounding: We can be decently confident of applications of IBE in ordinary, everyday and scientific contexts, but here we want to argue that IBE can be used in a metaphysical context and, more specifically, to establish grounding claims. In order to do this, we need to argue that at least in principle, the above questions can be answered for applications of IBE that aim to establish grounding claims.

We should be able to show how IBE is constrained, not least because if it were unconstrained, it appears that an all too simple argument for a principle of sufficient reason could be attempted along the following lines: Suppose we wonder whether a fact [*P*] has a reason why it obtains. Then if the application of IBE is unconstrained and if explanatory candidates such as candidate grounds are easily stipulated (as they appear to be), then IBE can establish the best available explanatory candidate.[249] Since [*P*] was arbitrarily chosen, it is unclear what should stop IBE from providing each fact with a reason why it obtains. It appears that if we let it come this far, the only option to stop this overgeneration is to claim that sometimes there must be several maximally good explanatory candidates and that then none of them – but also not their disjunction – can be inferred.

Luckily, there are several options for how the application of IBE to infer instances of grounding is constrained are available:

- We cannot always infer that something is grounded because sometimes a theory according to which something is ungrounded is explanatorily more valuable. This option is to a certain extent discussed in the following subsection.
- The explanatory candidates may not be as plenitudinous.
- There may be no unique best explanatory candidate and as a consequence IBE may not be applicable.
- There may be a threshold on the quality of explanations that can be inferred by IBE: If the quality of even the best explanatory candidate is below the threshold, it cannot be inferred, according to such a proposal.

249 Let us ignore empty-base explanation for the sake of convenience for now.

– IBE might only be applicable once it has been established that an explanation exists.[250]

A complete account of IBE as a method to establish grounding claims would have to choose and defend at least one of these options. In the remainder of this section, I will first look at how Biggs' account fares with respect to the questions raised above, and then I will offer some thoughts on how IBE might establish whether a given proposition is grounded in something, zero-grounded, or ungrounded.

7.4.1 Can Biggs' account deal with these questions?

Returning to Biggs' proposal briefly, we can observe that he does not sufficiently account for how explanatory candidates are determined, how the best amongst the candidates is determined, and how IBE is constrained such that sometimes we cannot infer a corresponding modal claim from a universally generalized conditional. While he (2011, 312, fn. 26) gestures at Lewis (1986b) for an idea to answer the two questions above, he does not properly formulate or defend an account here.

The existence of this lacuna in Biggs' account also means that he does not succeed in his secondary aim, namely to provide an abductive argument against dualist theories in the philosophy of mind and in favor of physicalism concerning the mental. At least, his case remains incomplete at this critical juncture, because he provides no criterion that tells us (nor method to determine) when the abductive inference is warranted and when it is not. Since it cannot be always warranted, lest IBE objectionably overgenerate necessities (or, in our case, grounding claims), the question remains whether it is warranted in the case of the mind-body problem. A related problem arises from the existence of dualist intuitions that conflict with the (physicalist) explanatory candidates that Biggs would like to establish: Biggs does not tell us why IBE should be able to trump such intuitions. Yet, he probably cannot completely abandon *all* use of intuition, for presumably some sort of intuitive judgment about what counts as an explanatory candidate and about relative explanatory strength is required to identify the explanatory candidates, rank them, and constrain the application of IBE. It may turn out that the dualist intuition that the physicalist candidate is not an explanatory candidate

250 But note that this may seem to conflict with our everyday practice, where we regularly use IBE arguably without knowing that an explanation does exist.

or not a sufficiently good explanatory candidate is the very kind of intuition that has to be considered in metaphysical applications of IBE.

Staying with the topic of intuition for a while: Inference to the best explanation as a method for metaphysics has partially been motivated by various broadly 'empiricist' skeptical concerns about intuition- and conceivability-based rationalist views.[251] In fact, it is sometimes explicitly suggested that abductive methods can address the empiricist worries, see for example Biggs (2011) and Roca-Royes (2017, 242). But IBE as a method for metaphysics can only respect the motivation to avoid these empiricist worries if the required methods for determining what the explanatory candidates are and how they are weighted to determine the best explanatory candidate are not similarly suspect. For if they are, it becomes unclear how the empiricist could accept the use of IBE in metaphysics (e.g. to establish grounding claims) although it involves the very kind of methods the empiricist finds objectionable.

Note that the point is not intended to be about labels, e.g. that IBE should count as a rationalist method rather than an empiricist method (for example BonJour (1998) seems to see it that way). Rather, if IBE is offered as a method for metaphysics that is able to resist broadly empiricist concerns leveled against applications of intuition and conceivability in modal metaphysics and elsewhere, it should be established that how we determine and weigh explanatory candidates does not rely on methods (such as certain forms of intuition) that are equally suspect by empiricist lights as proposals that directly invoke such methods (such as an intuitive faculty that allows us to determine the essential truths or what grounds what) for metaphysics. As far as I can see, this has not yet been established; for example, no such account is to be found in Biggs (2011). In fact, it seems quite plausible that intuition plays some important role in determining and weighing the explanatory candidates of an application of IBE – yet it is an open question why these intuitions should be more trustworthy than direct intuitions about what is necessary or what grounds what.

Note that even certain dialectical moves do not free the empiricist from this burden: For example, if we start with the assumption that IBE in general is respectable and then find out that its use in metaphysics involves aspects that are problematic for the empiricist, one reaction would be to conclude that the empiricist is mistaken, not only about IBE, but about intuition-based, rationalist methods as well. On the other hand, the empiricist might discard even IBE, at least as a method for metaphysics. Either way, the empiricist does not get from IBE what they wanted. A similar consideration seems to apply to some other broadly

251 For a number of works in this vein concerning modal epistemology see, e.g., the papers in Fischer and Leon (2017) and the papers mentioned in Roca-Royes (2017, 221).

empiricist accounts such as Roca-Royes' (2017) inductive account of knowledge of de re possibility for concrete entities. In this particular case, the open question is whether the similarity-judgments required by applications of induction according to Roca-Royes are admissible by empiricist lights.

7.4.2 Grounded, zero-grounded or ungrounded?

To close the chapter on more of a constructive note, let us think about whether and how explanatory considerations can help to decide whether a fact is ungrounded, grounded in something, or zero-grounded. More precisely, suppose there are three theories M_1, M_2, and M_3 which differ with respect to the grounding status of a fact [P]: According to M_1, [P] is ungrounded, according to M_2, [P] is grounded in something, and according to M_3, [P] is zero-grounded. Without going into the messy details, the theories are intended to be as similar as possible, but they need not only differ with respect to the proposition that [P] is grounded, for M_2 should also contain the grounds of [P], if there are any.

We can then ask whether explanatory considerations at least sometimes tell us to favor M_2 (according to which [P] is grounded in something) over M_1 (according to which [P] is ungrounded). The previous sections suggest that the answer is yes: M_2 contains the material for a grounding explanation of [P], while M_1 does not. But immediately, two further questions arise: First, what constrains explanatory considerations such that M_2 is not always valued over M_1? Second, suppose that explanatory considerations sometimes, but not always, value M_2 over M_1. Then it is a further question whether explanatory considerations ever value M_1 over M_2: Can *explanatory* considerations establish that certain facts are ungrounded, and if so, how?[252]

I want to focus on the latter question here. One idea as to how explanatory considerations might establish ungroundedness is that the fact that a certain fact [P] is ungrounded itself figures as a ground in a grounding explanation of some fact [Q] and can be established by an inference to the best explanation for [Q]. For example, suppose the abductive method sketched above does not establish a ground for a certain fact [P] – perhaps there are no candidate explanations, or perhaps none of the candidate explanations is good enough to be inferred. One might think that the very fact that no ground for [P] has been established so far is itself best explained by the fact that [P] is ungrounded. Formulated like this, it

252 Note that in asking this I do not want to suggest that there are no other possibilities of how ungroundedness can be established. For example, the fact that [Q] does not ground [P] might be derivable from other grounding facts that are incompatible with [Q]'s grounding [P].

seems plausible that if there are ungrounded facts, there are explanations like this, but further investigation would be required to clarify exactly how this kind of explanation operates.

A further idea is to apply a variant of the Methodological Maxim from the previous section:

(Methodological Maxim*)
In choosing between M_1 and M_2, the more why-questions you can pose and answer, the better. The more why-questions you can pose but can't answer, the worse.

But this maxim alone can often not favor a theory M_1 according to which [P] is ungrounded over a theory M_2 according to which [P] is grounded in [Q]. Let me explain:

- For M_1, the question why P arises and is not answered.
- For M_2, the question why P arises and is answered. Furthermore, the question why Q arises and is – let us stipulate – not answered.

It appears that the maxim is silent on whether to accept M_1 or M_2: While M_1 does not answer why P, M_2 appears to merely have traded the answer for the cost of a new why-question it does not answer, namely why Q. Note first that it does not make a difference if we consider the relevant (negated) grounding statements as well: For M_1 the question arises why [P] is not grounded and for M_2 the question arises why [Q] grounds [P].[253] It seems the only case in which the maxim favors a theory M_1 according to which [P] is ungrounded over a theory M_2 according to which [P] is grounded (in something) is if, according to the latter theory, [P] is fully grounded only in two or more facts taken together for which why-questions arise that do not arise for M_1.

So perhaps we have not counted correctly and we have to suppose that M_1 either contains [Q] or its negation. But this would only increase the amount of why-questions that arise for M_1 and are not answered (as we may stipulate in analogy to our stipulation about Q for M_2). Therefore, this change does not show that Methodological Maxim* alone can favor M_1 over M_2. It appears that a principle like Methodological Maxim* that involves merely counting why-questions and their answers can often not help decide in favor of a theory according to which a given fact [P] is ungrounded, rather than in favor of a similar theory according to which [P] has a ground.

253 If anything, this spells trouble for using the maxim to establish ungroundedness, because [P]'s not being grounded is plausibly grounded in [P]'s not being grounded in x, for every x, and this gives rise to a plenitude of why-questions.

Of course, alternatives are available: Perhaps M_2 will involve concepts that M_1 does not involve. If F is such a concept, then globally, M_2 will give rise to many why-questions that M_1 does not. For instance, suppose M_2 stipulates as a ground for [P] that some entity is F. Once the concept F is introduced, questions arise concerning what other things stipulated by M_2 are F and why they are F. Also, suppose that according to M_2 no other things are F. Then why-questions arise with respect to those things not being F. Depending on whether or not M_2 offers satisfactory answers, M_1 might be valued higher with respect to the Methodological Maxim*.

If we look beyond Methodological Maxim*, further options seem available: Perhaps M_2's being more (for example ideologically) can somehow be weighted against its answering more why-questions, such that it comes out as less attractive than M_1. A problem with this is that it is not quite clear how this weighting works. Here, an attraction of the Methodological Maxim* was that it suggested a unification of the theoretical value or disvalue of complexity and power to answer why-questions. Another (if perhaps not completely satisfactory) option would be to accept a certain bruteness of explanatory theoretical value – one theory is just explanatorily better than another with nothing more to be said, and we have some epistemic faculty (e.g. intuition) that can tell us which theory that is. But before we go that far, we should remember that we only enter the business of weighing two theories if they are epistemic possibilities: It is presumably at least possible to rule out a grounding proposal like M_2 on intuitive or conceptual grounds before any application of IBE or the Methodological Maxim*.

Now, once zero-grounding enters the field, things change: Let us see whether we can identify explanatory virtues that favor theory M_3 according to which [P] is zero-grounded over the similar theory M_2 according to which [P] is grounded in something, and over a similar theory M_1 according to which [P] is ungrounded. M_3 answers the question why P and apparently only gives rise to the why-question concerning the grounding statement. In this respect it does better than both M_1 which gives rise to both the question why P and why P is not grounded, and it does better than M_2 which answers why P but gives rise to the new questions why the ground(s) of [P] obtain and why the relevant grounding fact obtains.

So, focusing on the first case, it appears that for a given theory according to which certain facts are fundamental by way of being ungrounded, zero-grounding has the potential to generate alternative, explanatorily stronger, proposals. For each theory according to which a fact [P] is ungrounded, there is an alternative theory according to which [P] is zero-grounded. In contrast to ordinary grounding explanations, zero-grounding explanations do not involve any grounds, and hence they do not incur new explanatory burdens with respect to such grounds. *Prima facie*, the latter theory has therefore more explanatory power than the former

theory, since the latter allows for a zero-grounding explanation of [*P*], whereas according to the former theory, [*P*] does not have a grounding explanation; other things being equal, this seems to favor the latter over the former theory.

Are there now any other broadly explanatory virtues that rank the zero-grounding involving theory M_3 lower than either of its two rivals? It seems complexity will not do: M_3 does not involve any concepts or entities that are not involved in M_1 and M_2, and with respect to what facts it involves it seems similarly complex to M_1. It appears we are again left with three possibilities: First, there are other explanatory virtues; second, explanatory virtue is an at least partially fundamental matter; or third, it is only possible to decide against proposals for zero-grounding before the stage of weighing relative explanatory value is reached – for example by deciding on intuitive or conceptual grounds against the possibility of the relevant zero-grounding theory. Unsurprisingly perhaps, an upshot of this discussion is that a crucial part of an account of an abductive method that is able to establish grounding statements will be an account of how exactly the candidate grounding explanations are determined. One idea to be pursued here may be (as towards the end of chapter 5 to take more seriously the connection between explanation, understanding, and general explanatory principles, or unification more generally): The hope is that if candidates for instances of zero-grounding (and empty-base explanation in general) must be limiting instances of more general explanatory principles, then brute 'zero-ification' of the fundamental postulates of some theory will not be possible in general.

Conclusion

Let us recap: The goal of this book was to argue for the legitimacy of empty-base explanation and offer philosophically interesting applications of the idea. Aside from the overall argument, some things that I developed along the way include:

- a more solid theoretical footing for the notion of zero-grounding,
- an account of explanation by status,
- an account of ultimate explanation,
- an account of the empty-base explanation of logical truths,
- an investigation into metaphysically explanatory notions besides grounding that might allow for empty-base explanation,
- an investigation of the possibility of zero-causation (i.e. causation ex nihilo) and empty-base explanation by law of nature,
- a novel notion of self-explanation, and
- a study of the epistemology of empty-base explanations.

Novel philosophical ideas (especially those of the more 'out there' persuasion) have to earn their keep via their applications and theoretical fruitfulness. Otherwise they may turn out to be intelligible given some open-mindedness and conceptual flexibility, but remain more a curiosity than of serious philosophical interest. When I started working on this project, the only material discussing zero-ground were Fine's original paper and Litland's account of the grounds of ground. Since then, as reflected above, the literature has steadily grown. I hope that this book can make a further contribution in arguing that the idea of empty-base explanation really has intriguing applications.

Aside from investigating further applications of empty-base explanation, some areas in which I believe further research could be valuable are the metaphysics of multigrade and variably-adic relations, the epistemology of empty-base explanation (e.g. to better understand what lets us decide between a fact's being unexplained and the fact's being empty-base explained), the form of explanatory laws or generalizations that allow for instances of empty-base explanation (for a relevant recent discussion of the laws of ground see Litland and Haderlie (manuscript)).

Furthermore, the characterization of metaphysically explanatory relations besides grounding that allow for empty-base explanations could be improved (and it might be interesting to consider whether alternative notions of grounding such as Fine's (2012) natural and normative varieties allow for their own varieties of zero-grounding). Speaking of varieties: First, Muñoz's (2020) intriguing use of the combination of grounding contingentism and zero-ground deserves more attention; second, I have argued that Litland's (2017) argument concerning the

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grounds of ground likely generalizes to other explanatory notions; it would be interesting to further investigate whether we should embrace the generalized conclusion.

Finally, more realistic scientific examples of causation and laws of nature could be examined for potential applications of empty-base explanation. Most prominently, the suggestion by Hicks and Wilson (2021) based on Albert's and Loewer's *mentaculus* (cf. Loewer forthcoming), according to which the first event is empty-base explained by chancy law of nature, requires more detailed attention. Another starting point here could be the discussion in McKenzie (2017). Relatedly, cosmological arguments and considerations concerning the PSR could be reevaluated with the notion of empty-base explanation in hand, and for concrete proposals for explanatorily brute truths, the merits of alternative theories according to which these truths are empty-base explained could be investigated.

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